

THE AUTOMOBILE

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No. 8

CUBA'S PROMISING AUTOMOBILE FUTURE.

HAVANA, Feb. 17.—The Americans who came to Cuba because of the Havana Cup race learned much, even though they did not see other than the skeleton of a contest, which Demogeot won because one thing and another robbed him of his competitors. Nevertheless, he might have been the victor just the same, though 'tis good guessing that Lancia, Cedrino, and Bernin would have given him a fight for the trophy had not misfortune put them out of the struggle before half the distance had been traveled.

Those who visited Cuba for the first time enjoyed the perfect climate, motored over the surprisingly good roads, and realized that the automobile is certain to become a prominent feature in the development of the fertile island.

The Cuban government, under the wise administration of President Palma, has realized that the general prosperity would be greatly advanced by the construction of good roads. Appropriations have been liberal and frequent, and the work is being conducted under the direction of a native engineer who was educated in the United States.

The San Cristobal road, which was utilized for the race, was built for military purposes by the Spaniards, and it supplies a stretch sixty miles in length, with few turns except in the first ten miles.

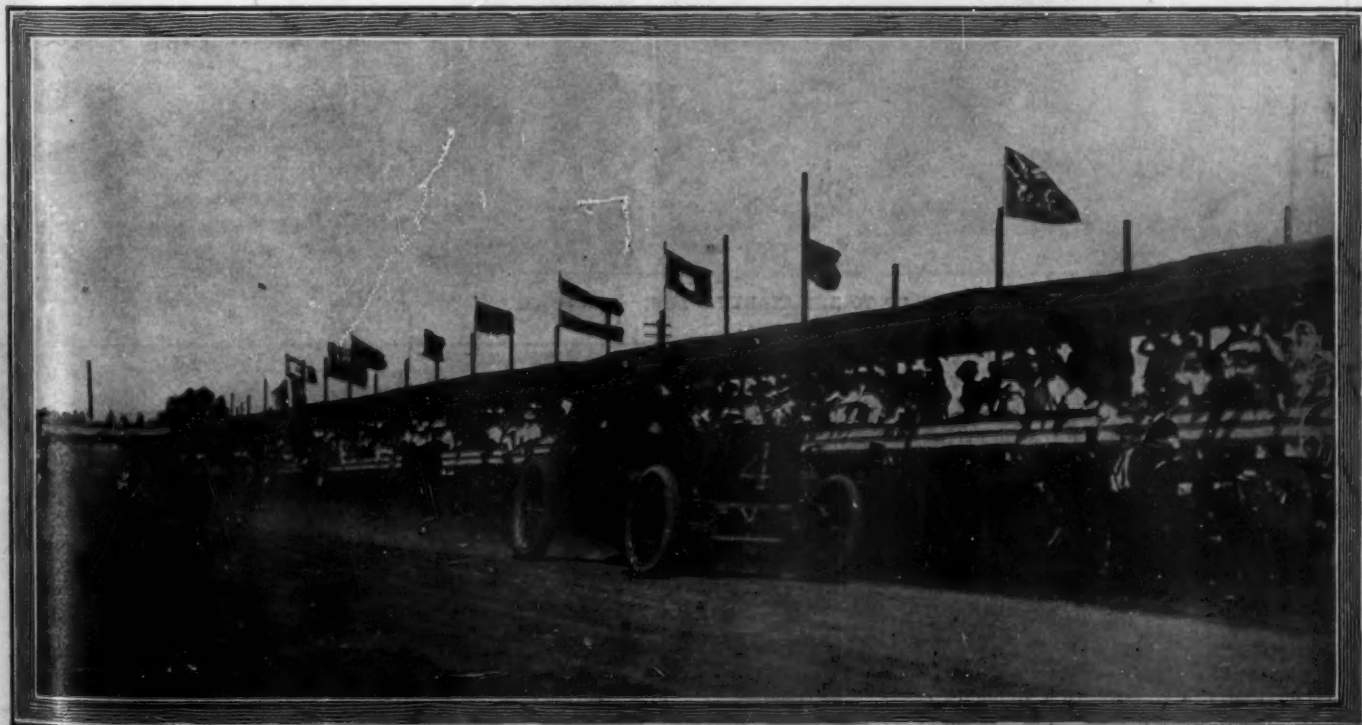
Though automobiling is in its infancy in the Cuban republic, the attitude of the natives towards automobilists is rather astonishing. Passing through a thickly populated country town, the advent of an automobile is an occasion for rejoicing, and

not a signal for a general attack. Even the mules sleepily regard the automobiles and give scant attention to their passing.

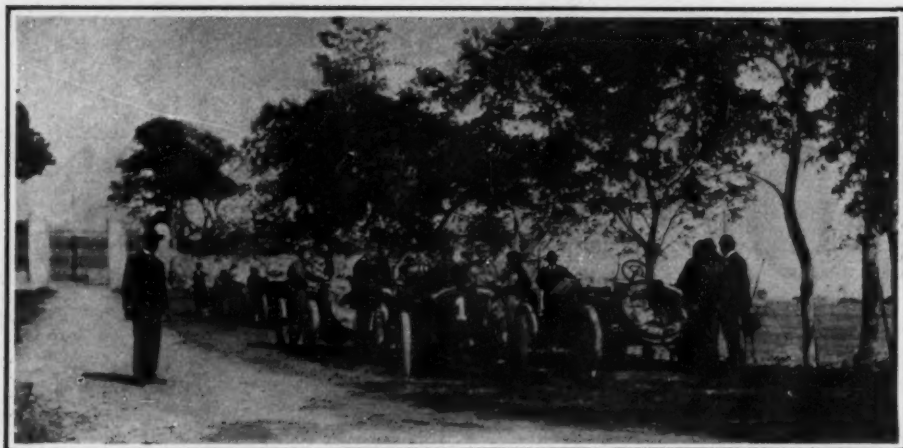
Of the 250 automobiles owned in and about Havana, a large number are imported, and it would seem that the American maker has been somewhat slow in looking after a market which is so close at hand. True it is that there are 'buses of American manufacture in use, but in great degree the field has been but little considered.

Havana contains several garages, but Americans not speaking Spanish may find it somewhat difficult in making their wants thoroughly understood. The price of gasoline, too, is a bit high, bringing fifty cents a gallon in some parts of the island.

After making the most complete arrangements for the Havana Cup race, it was a



VICTOR DEMOGEOT, CAPABLE SUCCESSOR OF HEMERY, WINNING THE HAVANA CUP IN THE 86-H.P. DARRACQ.

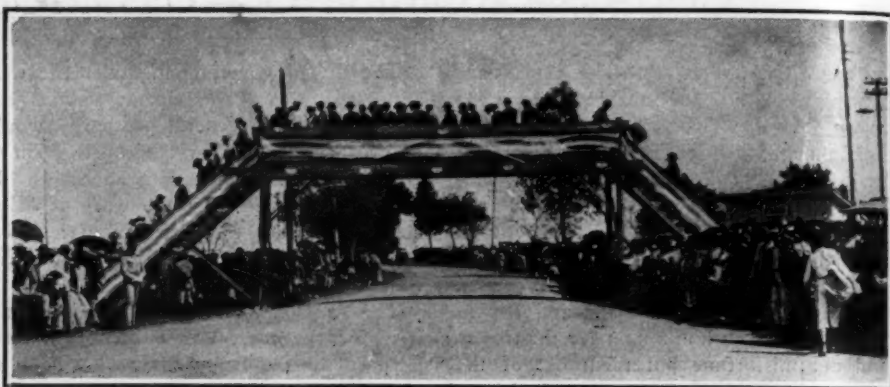


ASSEMBLING OF THE COMPETITORS IN THE EARLY MORNING.

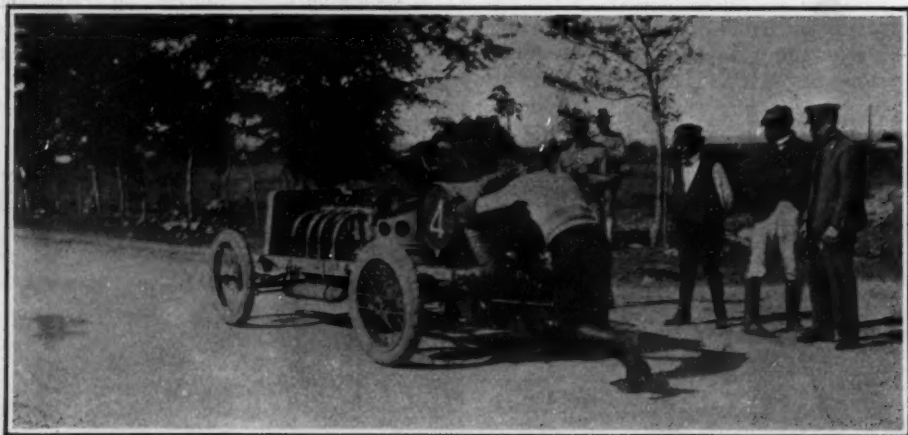
matter of great disappointment to the International Racing Association of Cuba and thousands of onlookers that only one car survived the 217.97 miles. Demogeot drove a good race and is entitled to all the honor that came his way. It was through no fault of his own that none disputed his championship title.

Lancia unhesitatingly went to the aid of Cedrino when the latter ended his career in the ditch on the first round of the course, and Bernin's tire difficulties anchored him alongside the road for such a period that he had no chance of catching the flying Demogeot unless misfortune assisted.

Another year it is proposed that the



NO ONE WAS ALLOWED TO CROSS THE COURSE EXCEPT VIA THE BRIDGE.



PUSHING THE DARRACQ UP TO THE STARTING LINE

Southern circuit begin with the race in Cuba, which will ensure for the Havana race a large field of starters instead of the remnants of the Ormond-Daytona participants. Cars can be shipped direct from New York to Havana, and the Florida meet will follow early in March.

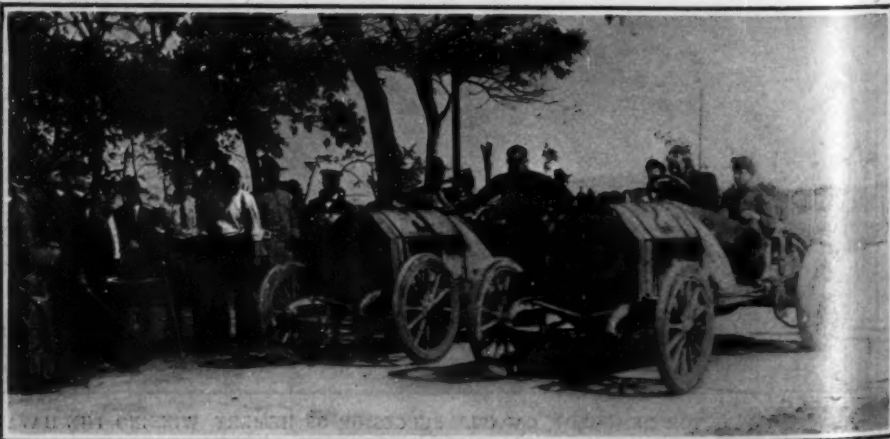
None can gainsay the excellent arrangements of the Cubans, in whose efforts the government lends a hearty second. The Rural Guard polices the course, and does it in a manner which does not antagonize the inhabitants; in fact, the Cuban plan, despite the fact that the country is a republic, is very similar to what is possible in France in the holding of a big race. S. M. Butler, the timing expert of the Automobile Club of America, directed this part of the work.

and the energetic W. J. Morgan did the preliminary booming and negotiated foreign entries. Otherwise the whole idea was Cuban from start to finish, with E. J. Conill the active leader.

One surprising thing in connection with the race apparently was the scant courtesy given to the visitors. Russell A. Field, a well-known automobile writer, made this comment: "The hospitality and help offered by the management to the American newspaper men and tourists who made the long journey was a disappointment, and explainable only on the ground of inexperience and not realizing the requirements of the situation. The English-speaking people connected with the Havana newspapers put themselves out to aid the visitors in every

way possible, but the association conducting the race forgot that strangers, uninitiated in the ways of Cuban life, and unused to the language, had traveled hundreds of miles to see their race and tell the world all about it. The newspaper men and even some of the prominent American automobilists were left to reach the start in the best way they could find."

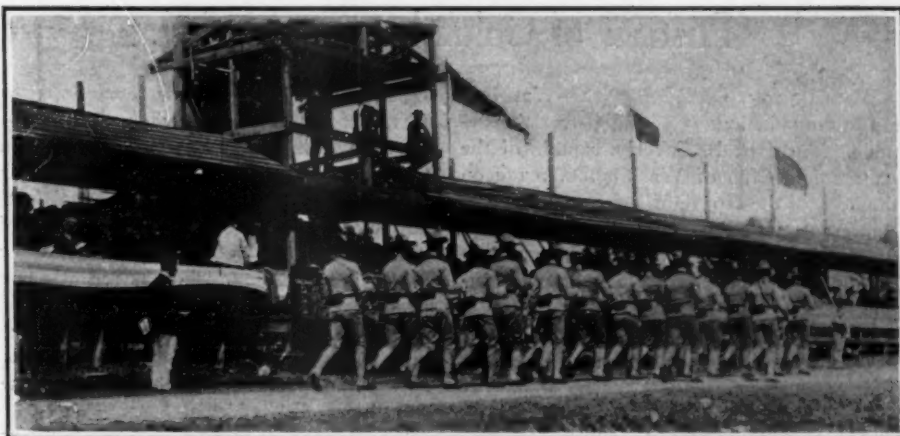
Of course, everything will have its features that can be criticised, and another year the San Cristobal course should see a perfectly run event, with a substantial number of starters, and the attendance of a small army of American enthusiasts who desire to drive their cars over the excellent roads of the "Pearl of the Antilles."



LANCIA AND CEDRINO, THE FIAT TEAM, READY FOR THE START.

Grand Prix of the A. C. F.

PARIS, Feb. 9.—The complete regulations governing the long-distance road race known as the Grand Prix are at present undergoing a final revision and will be published officially within a week. No change will be made in the main features of the contest, already described in THE AUTOMOBILE. The race will be held on two consecutive days, probably Tuesday, June 26, and Wednesday, June 27, six rounds of the circuit being covered each day, giving a total distance of 1,260 kilometers (787 miles). There will be no controls on the circuit, and no workmen will be allowed on the road, other than those at the fixed store stations under the control of a commis-



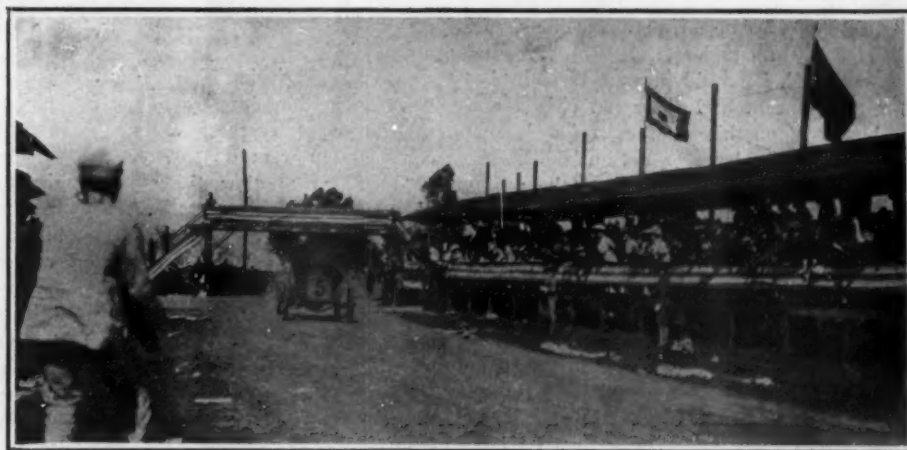
THESE WERE THE SOLDIERS WHO KEPT THE COURSE CLEARED.



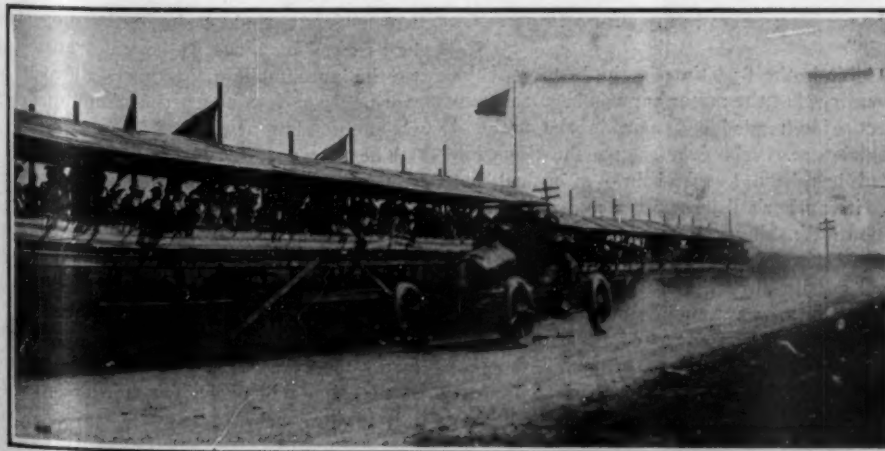
LANCIA IN FULL CRY OVER ONE OF THE BEST STRETCHES.

sionaire. Thus the driver and his mechanic will have to attend to all repairs of tires, filling of tanks, or repairs to machine, quite unaided. Entrance fees will doubtless be fixed at \$1,000 per car, and the maximum number of entries will be three for each firm or group of firms where several construct under the same license.

It is probable that the racers will be started on the first day with one-minute intervals, and on the second day they will be sent off in the order of their arrival on the previous day, and at exactly the same time. Thus, if the first three cars finished the race at respectively 5.00, 5.02 and 5.15, they would be started the next morning at 5.00, 5.02 and 5.15. By this means the calculation of time will be exceedingly simple, and



J. RABELL'S 30-H.P. CLEMENT, WINNER OF THE SPECIAL RACE FOR THE BIG WAGER.



BERNIN, THE RENAULT DRIVER, WHOSE TIRE TROUBLES DESTROYED HIS CHANCES.

the two days' event will be followed by the public as readily as a one day's straightaway run. Any car which has hopelessly lost its position in the race will be called upon to withdraw; a loss of three hours on the leading machine will probably be the limit fixed.

European Circuit Hanging Fire.

The 3,000 miles reliability trial through Europe brought forward by the Marquis de Dion and adopted by the Automobile Club of France as one of their big events during 1906, has up to the present failed to arouse a great amount of enthusiasm. Although the tour does not commence until the end

of July, entries close on April 15. At the time of writing only two engagements have been officially received, both being Darracq cars. It would be unfortunate if the event lacked interest owing to scarcity of entries, for a 3,000 mile tour through the different countries of Europe is bound to be an interesting sporting event and to secure no small amount of benefit to the firms whose cars successfully accomplish the run. Entrance fees are fixed at \$200, \$300, \$400, and \$500, according to the four classes into which the competitors are divided.

It is about time for an outbreak of hysteria on the part of the daily press in a discussion of "what becomes of the old automobiles?"

District of Columbia Legislating.

WASHINGTON, D. C., Feb. 17.—Washington automobilism is all agog over the denunciation of R. B. Caverly, captain of the Automobile Club of Washington, made on the floor of the House of Representatives by Representative Sims, of Tennessee, author of the bill now pending in Congress to regulate the use of automobiles in Washington.

Rising to a question of personal privilege, Representative Sims read an interview given by Captain Caverly to one of the local papers, in which he said in part: "A man who would father such a bill as that now before Congress for the regulation of automobiles in Washington, would have trouble keeping out of the way of himself. With all due respect to Representative Sims, I would say the measure is ridiculous in half a dozen ways. The idea of running an automobile twelve miles an hour and slowing down to eight miles an hour at every corner is laughable, and the idea of running at specific rates of speed on certain streets at designated times, as provided in the bill, is amusing. A man would have to carry a chart in one hand and keep the other busy following out the rules. That part of the bill providing imprisonment for a man who has once been fined on the charge of violating the law would make it dangerous for a citizen who owns an automobile to use his machine after having faced the police judge, because, if perchance he should accidentally misunderstand his chart and get arrested, it would mean a term in jail for an innocent and respected citizen and a blotch upon his character for having been behind the bars. Mr. Sims' bill might be applicable in Linden, Tenn. (the representative's home town), where the squares are full grown, the streets less crowded and automobiles scarcer, but it won't fit Washington or any other city. It's ten years behind the times."

Congressman Sims then proceeded to score Captain Caverly in unmeasured terms, saying, in part:

"Mr. Speaker, the object of this article just quoted, of course, is intended to ridicule the bill, and try to kill it in this way. I think the bill is of importance. During the last Congress I was told by police officers that certain individuals had been arrested and fined as many as three times a day. As a matter of course, they were not arrested and fined for each offense that they committed. Rich, reckless, dare-devil young men, driving automobiles simply for pleasure, violated the police regulations of the District of Columbia with impunity and paid their fines as a matter of levity, and went wild in their reckless career. Upon investigation I found that there was no law in the District authorizing imprisonment for violation of this regulation.

"The bill I introduced was drawn by an officer of the District, and is, with few ex-

ceptions, the present police regulations; yet this Captain Caverly, whoever he is—I never saw him or read of him, but he seems to be president of the Automobile Club (he is captain of the club, as a matter of fact), and therefore is the representative of his club. Judging from the article only, I imagine he is a chauffeur who has recently been promoted from a push cart or driver of a dray, as he seems to have about the conceptions we would expect from such a person. Being thus promoted, he has got what we call 'the swell head.'

"He denounces this bill as being ten years behind, lacks ten years of being up to date, when, with slight changes, it is the present police regulations of the District; yet he and his kind care so little for regulations that only impose fines as punishment that he does not even know what the regulations are. Why, of course, such gentlemen as he is will not like imprisonment features of the bill. There is no doubt but that a great majority of the people who own automobiles in the District of Columbia do not violate the law, but are careful to observe it. But there are just enough of these reckless characters at large on the streets to make it dangerous to travel the streets. It seems somehow or other that the driver of an automobile comes to the conclusion that he is a kind of superior being. I am very serious about this matter, and I hope the members of the house will look into it."

After again paying his respects to Captain Caverly, holding him up to the ridicule of the house of representatives, the wrothy congressman went on to say:

"There is another thing—this nuisance of having a fog horn blown in your ears continually. Here comes an automobile on the right and it toots its horn. Here comes an automobile on the left and it toots another horn, and the poor pedestrian does not know which way to start, but he knows his life depends upon successful dodging. What is the necessity of having these things? The sooner these rich and reckless auto drivers are put behind prison bars, the better it will be for the good people of this city, and no amount of ridicule will have the slightest effect in my efforts to pass this bill."

This is the first time in the history of the country that the motor car has been the subject of extended comment in the national legislature. Whatever chance the Sims bill had has been knocked into a cocked hat by its author's denunciation and ridicule of one of Washington's representative business men. Captain Caverly enjoys the respect and good will of the entire community, and is a leader in automobile affairs, being one of the charter members of the Automobile Club of Washington.

The board room of the district commissioners was packed with automobilists

Thursday when the hearing was begun on the Sims bill. The principal argument against the bill was made by President W. S. Duvall, of the Automobile Club, and a brief statement was also made by Captain R. B. Caverly. President Duvall, who is a lawyer, made a very able argument against the bill, and then presented a substitute measure, which he claimed had not only logic and reason behind it, but also voiced the sentiments and the wishes of the automobilists of the city in general.

The substitute bill provides that automobilists, between the hours of 9 A. M. and 7 P. M., and in the territory bounded by H street, Pennsylvania avenue, Sixth street and Fifteenth street, northwest, shall not be driven at a higher rate of speed than twelve miles an hour, and that during the same hours the speed on Pennsylvania avenue, between the Capitol and the White House, be eight miles an hour. Various other rates of speed in prescribed boundaries are set forth in the substitute bill. It is further set forth in the bill that nothing in it shall be construed as permitting dangerous speed at any time or place, and that operators at all times must be governed by surrounding circumstances. Penalties for violations are fixed at not less than \$1 nor more than \$20 for the first conviction, and \$5 to \$50 for a second within six months, with imprisonment not exceeding thirty days, in addition, at the discretion of the judge.

It is generally believed the death knell of the Sims bill has been sounded.

CAN SOLDER ALUMINUM.

INDIANAPOLIS, IND., Feb. 17.—Richard Smith, for some time employed in the tin-shop of the Nurdyke-Marmon Company, has leaped into prominence among the automobile men of this city by the discovery of a process for soldering aluminum which he believes is not generally known.

While at work a few days ago Mr. Smith chanced to overhear a remark that when ready to polish an automobile part valued at \$250 had been found to be filled with sand holes and would either have to be thrown away or recast. When Mr. Smith remarked that he could solder the part he was at first thought to be joking; but when he asserted his sincerity he was transferred to the automobile department and put to work. In a few hours the aluminum part was as good as new.

The discovery by Mr. Smith was the result of years of experimenting while employed in the motor department of the Dayton Gas, Light and Coke Company. He had never put it into practical use until a few days ago at the automobile factory. At present the process requires tedious labor, but Mr. Smith expects by further experiments to make the work more speedy, and at that time will probably take steps to protect his discovery.

Detroit's Fifth Successful Show.

City of the Straits Exhibition Had Large Crowds, Many Sales, and Set a New Mark.

DETROIT, MICH., Feb. 17.—When to-night, shortly before midnight, the strains of "Home, Sweet Home" floated through the Light Guard Armory, there came to a close what was undoubtedly the most successful automobile show which the city has ever seen. In general value of the exhibits, attractiveness of display, attendance and business transacted, the show sets new marks for the annual event, and more than ever before the general public has been forced to realize the hold which the automobile has upon the popular demand.

The Detroit show is the fifth which has taken place under the management of the

the crowd congested every evening, and jams were encountered everywhere. Many of the exhibitors were unable to secure space for more than a car or two, and some of the distributors of several lines had their sample cars in widely different parts of the hall. Next year Detroit will probably have a music hall that will house any automobile show on earth, so far as floor space is concerned.

The management made use of every atom of room available. The basement, which had, in former years, been given up to a dog show, was packed with cars. The smoking room and ladies' parlor, off the main floor,

taxidermy, and no others of the sidelines which have before been thought necessary as attractions. The cars were there, and the way they drew the people showed that the management had made no mistake.

In view of Detroit's prominence in the automobile manufacturing world, it created no surprise when it was seen on even the most cursory examination, that the show was distinctly a Detroit affair. Of course, there were a few of the leading lines manufactured elsewhere on exhibition, but the Detroit cars were the undoubted feature of the show, and took up fully two-thirds of the floor space.

The Cadillac had, as in past years, the largest exhibit. The firm showed its regular models which have done duty elsewhere round the show circuit, and Tuesday signaled, with a real celebration, the advent of the big \$5,000 limousine. M. S. Brigham,



GENERAL INTERIOR VIEW OF DETROIT LIGHT GUARD ARMORY DURING FIFTH ANNUAL AUTOMOBILE SHOW, FEBRUARY 12 TO 17.

Tri-State Automobile and Sportsmen's Association, of which William E. Metzger is president and Seneca G. Lewis the secretary. This year the preliminary arrangements were in charge of E. E. McMaster, and much is undoubtedly due to his care and foresight. The hall itself was beautifully decorated in maroon and white bunting; the general arrangements were excellent, and the management had even gone so far as to place at all the emergency exits uniformed employees with instructions to open the locked doors immediately in case of fire or panic.

But the hall was too small for the show. It has now outgrown the largest building available for the purpose in Michigan, and the exhibitors had to put up with all sorts of inconvenience. The aisles were narrow,

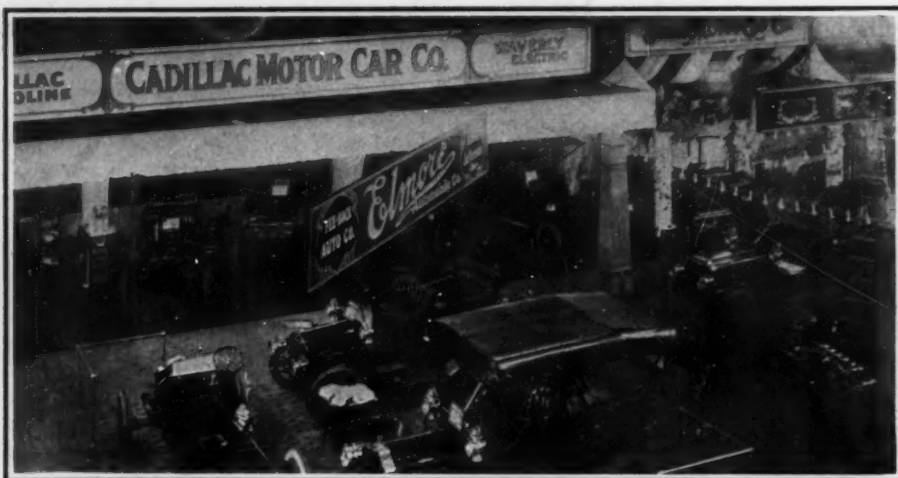
each housed an attractive exhibit. And, in spite of the handicaps, the show succeeded nobly.

The show opened Monday evening and a crowd of 5,000 people broke all records for first-night performances, and in every way manifested their interest and enthusiasm in the most comprehensive exhibit of automobiles. Of course, there were a couple of stepladders still in evidence during the early part of the evening, and occasionally one would stumble over the prostrate form of an electrician, but even these disappeared as the evening progressed.

In its general lines the show of 1906 differed from others that have preceded it here, chiefly in the fact that it was an automobile show, pure and simple. There were no dogs, no shooting galleries, no display of

the manager of the retail branch, dubbed it the "Queen of the Show," and people certainly did it homage. This car, which is four-cylindred and of most elaborate construction throughout, will be manufactured on special order only.

Across the aisle was the Ford with "Lou" Block, who has chased the show circuit up to date and will chase it to its final resting place, in charge. H. I. McMullen has been appointed Detroit sales manager, and he, with a bunch of assistants, was busy all week with people deep round the little \$500 runabout. This car was, of course, one of the hits of the show. The Ford six-cylinder touring car and one of the two-cylinder light touring cars formed the rest of the exhibit, and Henry Ford himself, James Couzens, Frank Kulick, and others of the



ELMORE AND CADILLAC STANDS, SHOWING DECORATIVE FEATURES, AT DETROIT SHOW.

factory staff were in attendance all the week.

The Wayne and Reliance, both Detroit-made cars, had fine exhibits, and the Wayne set a pace for sales that had the others guessing for the first two days of the show. The big \$4,500 limousine was the first to have "Sold" posted on it.

The Reliance Motor Company, which has recently been reorganized with F. O. Paige, former president of the Detroit Automobile Company, as president, and O. W. Mulkey as secretary and general manager, is reversing the usual order of things this year and is featuring its commercial vehicles, while continuing still to produce its regular touring car model. The commercial cars have two-cycle engines, and the three models shown were extremely serviceable in appearance. The firm has already ordered fifty of the heavy delivery type "put through" the factory, and has them all practically sold already, according to Mr. Mulkey.

One of the novelties of the show was the Motorcar Company's new friction drive. This firm exhibited to an admiring crowd in the basement, and hooked its machinery to an electric motor for purposes of demonstration. The arrangement permits of an indefinite number of speeds and reverse, all governed by one lever. The arrangement is simple, and its manufacturers expect that it will result in a revolution in automobile manufacturing. The firm has protected the whirling disk device by patents, and will turn out in the neighborhood of 100 cars this year, with a view to making a big splurge in 1907.

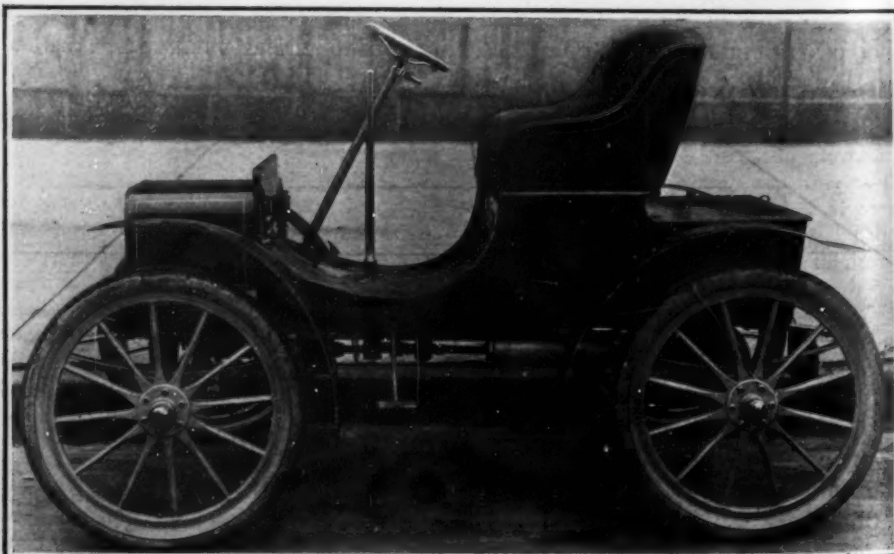
The Aerocar, also a new Detroit concern, displayed only one model, a four-cylinder, air-cooled pattern, that was good enough in its tests to attract an investment of capital from several gentlemen who have been identified with the automobile manufacturing industry in Detroit long enough to know a good thing when they see it. Alex. I. Malcomson, one of the incorporators of the Ford Motor Co., is president of the new concern, which will soon be occupying a large factory here. The structure is already practically complete.

The C. H. Blomstrom Co., also of Detroit, made a large display of its handsomely designed Queen cars, and the Packard had one chassis on view, fenced in by brass railing, on which scores of people were leaning all the time. The Packard will be handled in Detroit this year by the Standard Auto Company, of which James Brady is manager. The firm had another booth also, at which it displayed Peerless and Welch cars.

Large spaces were taken up also by Michigan-manufactured cars, among which the Buick, the Jackson, the Rapid, Reo, Oldsmobile and the Soules were prominent. The Oldsmobile, which will be handled here in 1906 by John P. Schneider, one of the pioneer distributors, had its complete exhibit as shown at New York and Chicago.

The Maxwell-Briscoe McLeod Company, distributing agents for the Maxwell-Briscoe and Aerocar, had an attractive display in the ladies' parlor just off the main hall. An array of cups, shields and trophies, won by the Maxwell, lined the walls.

The White display on the main floor was tastily gotten up under the management of "Jack" Pechin, head of the local branch.



"PARAGON" SMALL CAR, EXHIBITED FOR THE FIRST TIME AT THE DETROIT SHOW.

White carnations were given away by the thousand.

The Northern folks got a little additional space from the Paragon people Tuesday, and managed to get room for their new air-controlled car. The little \$375 Paragon will be handled in the Wayne agency at retail, with J. C. Foster in command.

The Detroit Automobile Company, which handles the Winton, had a big advantage over the other firms through the fact that some of the 1906 models had been in use in Detroit for three months.

William J. Roepke and J. F. Wood, local agents for the Reo, were able to show but two models, the firm's regular exhibit having been shipped to Cleveland by mistake.

An elaborate array of accessories filled the gallery; pumps, fittings of interest to the manufacturer, accessories for the owners of cars, batteries, lamps, and even one display of bicycles—the lines still handled by "Billy" Metzger—filled it to the brim, and there was not an idle inch.

Business transacted during the show was amply satisfactory. Contracts were made for fully 150 cars, to say nothing of the enormous number of certain purchasers reserving their selection till more further demonstration was possible. The weather, except on opening night, was rainy and cold, but the crowd was plucky and allowed the atmosphere to cut no figure. Demonstration outside the armory was difficult, however.

Exhibits That Were New.

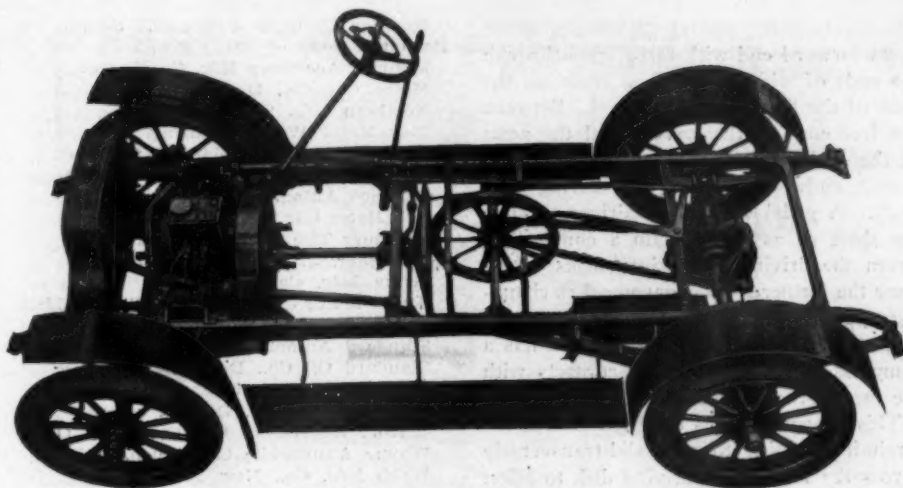
An exhibit on the main floor of the Detroit show that centered the attention of the crowd was the diminutive runabout, styled the Paragon, and first publicly exhibited at this show. It is manufactured by the Detroit Automobile Mfg. Company, and at the first glance looks like a small buggy. The resemblance is in the lines of the body and the buggy top, but a more minute inspection reveals many of the characteristics

of the automobile runabout pure and simple. There is a short hood in front, covering the twin cylinder, V-shaped, air-cooled motor of 5 horsepower, a regular pillar and steering wheel and artillery wood wheels. The wheelbase is 58 inches and the tread 42 inches. The Paragon is sold at an extremely low price; in fact it is the lowest priced machine on exhibition at any of the shows already held.

In this little car the drive is by propeller shaft to the rear live axle, the transmission being a modification of the planetary gear controlled by a single lever working in a double slot after the manner of a selective type gear. The lever is of considerable length and rises up in the middle line of the car to the left of the driver. In its normal vertical position no gears are in engagement, and when pushed forward in one slot it engages the high gear and in the other the low gear. Pulled back, the lever operates the reverse. A slender vertical rod in the floor operates the throttle, and the spark lever is conveniently placed under the steering wheel.

The frame of the car is of angle steel and the front and rear springs are of the three-quarter elliptic type. Roller bearings are used in front and rear wheels, which are 28 inches in diameter and fitted with 2 1-2 inch single tube tires. The air-cooled motor has cylinders 3 by 3 inches and automatic inlet valves. It is lubricated by two large sight-feed oil cups mounted on the dash. Ignition is by jump spark. The brakes, operated by pedal, are located on the rear wheel hubs. Ready for the road, the car weighs 550 pounds, and the manufacturers state that it is capable of a range of speed from four to twenty-two miles an hour.

Another new product of local shops, though of a different type, was the Walker runabout with double-opposed motor in front, single seat for two persons, and beetle back with hinged lids. It is a full-sized machine, the motor having a rated capacity of 10 horsepower. The general lines of the



CHASSIS OF CARTER CAR SHOWING FRICTION DRIVE TRANSMISSION.

car are good and there is nothing freaky either in appearance or construction.

The power plant and running gear of the car are built in a self-contained chassis, the frame being of angle steel. Full elliptic springs are used all around, the front attached directly to the frame and the rear carried on swivel hangers formed on side extensions of the rear cross member of the frame. The wheelbase is 78 inches, the tread standard and the wheels of the artillery type 28 by 3 inches.

The power plant is very compact and entirely covered by the hood, with radiator in front. The motor is designed with the cylinders separate from the crankcase, with male and female joint formed by an extension of the cylinder bore beyond the square, flanged face of the cylinder casting where it is bolted to the opening in the crankcase. The crankcase and the casing for the planetary change speed gear, which are integral, is divided horizontally and bolted through lugs. When set in the car the engine flywheel is in front, the spokes being arranged to act as a fan when running. The outboard ends of the cylinder castings are provided with faced seats which are bolted

directly to the side members of the angle steel frame; the third point of suspension is secured by the attachment of the transmission casing to a saddle which is fastened to the frame. Lubrication is taken care of by a gang sight-feed oiler carried on top of the crankcase and worked by the case pressure. The motor cylinders are 4 by 4 inches, with a rating of 10 horsepower at 700 revolutions. Both intake and exhaust valves are mechanically operated, and they are located on top of the cylinders so that they are readily accessible, a point of considerable importance not always borne in mind by designers.

Drive is by propeller shaft to the rear live axle. The front axle is also tubular and stiffened by a truss. Motor ignition is by jump spark, the coil being carried on the dash. Gasoline tank capacity is 8 gallons, and the radiator of the vertical finned-tube type contains 3 1-2 gallons of water. The planetary gear gives three speeds and reverse, and the range of speed of the car is from four to thirty miles an hour.

In the basement of the Detroit show a new friction-drive car, styled the Carter car, was exhibited by the Motor Car Company, of Detroit. This is a light touring car which in its outside appearance follows the conventional motor-in-the-front type, with pressed steel frame, dished dash, semi-elliptic spring suspension and side-entrance body, seating five persons. The contrast between this conventional exterior and the construction of the chassis was visible to all visitors at the show, as both a complete car and a chassis were on view.

The motive power is furnished by a double-opposed motor, with cylinders 5 inches by 4 1-2 inches, rated at 20 horsepower. This is set back of the radiator in the usual motor-in-front position with the flywheel in the usual place back of the engine. The cylinder heads have seatings cast integral which are bolted to the side frames. The friction driving gear is located in about the center of the chassis, the driving disk being set across the car and the driven disk, or rather wheel, rotating in the same direction as the road wheels. The shaft



CARTER 20-HORSEPOWER CAR WITH DOUBLE-OPPOSED ENGINE SET TRANSVERSELY UNDER HOOD

which rotates the driving disk has a spider at its forward end with three arms through the ends of which three long studs on the back of the flywheel are inserted. Between the free ends of these studs and the arms of the spider are stiff coiled springs which permit endwise play of the driving disk shaft. A pedal enables the driver to slide the shaft so as to maintain a contact between the driving and driven disks or release the former from engagement in changing speeds or stopping the car when the motor is running. The driven wheel has a compressed paper rim which contacts with the face of the cast-iron driving disk.

This driven wheel is mounted on a countershaft on which it can be slid transversely across the face of the driving disk to effect changes of speed or to reverse in the familiar way. On the hub of the driven wheel a chain sprocket drives through the single chain to the rear axle without the interposition of a differential.

Details of ignition, lubrication, and motor-cooling, on the thermo-siphon plan, follow well tried practice. The ignition is by jump spark, and the controlling lever for spark advance and that for the throttle are placed on a fixed quadrant above the steering wheel. The wheelbase is 94 inches, tread 54 1-2 inches, and the wheels, 30 by 3 1-2 inches.

A novel little feature in a familiar type of car was a supplementary seat on a Pope-Toledo 20-horsepower machine fitted with a runabout body. The metal body was fitted with the usual turtle back, which, however, had a hinged plate in the top. By lifting up this plate a supplementary seat was disclosed fastened to the under side of the plate, the back being hinged down out of the way. When the plate was turned back and bolted down and the seat back erected a most comfortable seat was provided for a third passenger, who disposed his lower extremities in the space below the seat in the turtle back. When closed down the seat was in no way visible.

Complete List of Exhibitors.

The following is a complete list of the exhibitors, alphabetically arranged:

Aerocar Co., Detroit.
Aetna Life Ins. Co., Hartford, Conn.
American Lamp Co., Detroit.
Auto Brass & Aluminum Co., Flint, Mich.
Automobile Equipment Co., Detroit.
Blomstrom Motor Car Co., Detroit.
Boyer, Radford & Gordon Tank and Pump Co.
Briscoe Mfg. Co., Detroit.
George, Edwin S., Detroit.
Grant Bros., Detroit.
Gray & Davis, Amesbury, Mass.
Hayes Manufacturing Co., Detroit.
Herz & Co., New York.
Horseless Age, New York.
Haytt Roller Bearing Co., Harrison, N. J.
Hydraulic Oil & Storage Co., Detroit.
Jackson Automobile Co., Jackson, Mich.
Jones Speedometer, New York.
Maxwell, Briscoe, McLeod Co., Detroit.
Metzger, Wm. E., Detroit.
Michigan Bolt & Nut Works, Detroit.
Michigan Steel Boat Co., Detroit.
Michigan Storage Battery Co., Detroit.

Monnier Cycle & Automobile Supply Co., Detroit.

Motor & Accessory Mfg. Co., Detroit.
Motor Car Co., Detroit.
Northern Mfg. Co., Detroit.
Olds Motor Works, Lansing, Mich.
Pungs-Finch Automobile Co., Detroit.
Rapid Motor Vehicle Co., Pontiac, Mich.
Reliance Automobile Co., Detroit.
Reo Motor Car Co., Lansing, Mich.
Salsbury Tire Co., Owosso, Mich.
Schneider, J. P., Detroit.
Schug Mfg. Co., Detroit.
Soules Motor Car Co., Grand Rapids, Mich.
Splittorf, C. F., New York.
Standard Automobile Co., Detroit.
Standard Oil Co., Detroit.
United Mfg. Co., Detroit.
Walker Motor Co., Detroit.
Warner Instrument Co., Cleveland, O.
Wayne Automobile Co., Detroit.
Webb Mfg. Co., New York.
Weber, W. H., Detroit.
Welch Motor Car Co., Pontiac, Mich.
Wheeler Mfg. Co., Detroit.
White Garage, Detroit.
Young & Miller, Detroit.

BALTIMOREANS AMUSED.

BALTIMORE, Feb. 17.—A farce, in which an automobile innocently figured as the chief character, reached its climax yesterday in this city. A month or more ago the Park Board of Baltimore purchased a car for the use of its members and for showing distinguished visitors the city's out-door recreation places. The automobile was a good one—in fact, one of the best made—but Comptroller Heffner, who, of course, passes on the city's bills, refused to O. K. the expense, claiming that the method of procedure in the purchase of the car was not in accordance with regulations. It was up to the Park Board to forfeit the loss. Naturally it balked at this.

A way out of the dilemma presented itself to the austere body and the result has caused a ripple of amusement among automobilists of the city. The point of the whole affair is this: Advertisements were inserted in the newspapers for bids on a car of specified horsepower and price and "the name of the only make of car on which such bids would be considered was given in the advertisement." The company which carries the car specified was the same concern that sold the Park Board the first automobile, which was rejected by the comptroller and, of course, was the only dealer in the country from which the automobile desired could have been purchased.

Gasoline is a by-product and the demand for it for power purposes in gasoline engines, automobiles, etc., has increased so rapidly during the past few years that the price has practically doubled, and the indications are that in future gasoline will cost even more than it does now. When gasoline is produced from crude oils, heavier oils are left, and the difficulty encountered is to find a market for the heavy oil. If these heavier oils cannot be disposed of at a profit, gasoline must be sold at prices which would compensate for the loss on the heavier oils.—G. W. Mead in *Acetylene Journal*.

National Motor Boat Show.

The growing importance of the motor boat as an appurtenance of all forms of outdoor sport is fully demonstrated by the exhibition which opened on Tuesday night at the Madison Square Garden in New York. In the early days of the sportsman's show, a dozen years ago, a few small launches appeared timidly among the numerous exhibits of game and sporting implements which filled the whole of the big Garden; this year the launch, in a great variety of forms, monopolizes the main floor and most of the gallery space, with the camping appliances and similar gear as a background.

The National Motor Boat and Sportsman's Show, as it is now known, is under the management of the National Association of Engine and Boat Manufacturers and of the Sportsmen's Exhibition Company, and will occupy the Garden for two weeks from February 20 to March 8, inclusive, being open every week day from 10 A. M. to 11 P. M. It is the twelfth of the great annual exhibitions held at the Garden and the second in which the nautical element has predominated.

The general arrangement of last year has been followed, the decorations in natural green and the center of the arena devoted to a great oval lake with an island in the middle, but the lake will be larger and deeper. Its increased circumference will give a course of ten laps to the mile for the canoe and other races which are always such a popular feature, and the added depth will permit of a freer use of the power boats than was possible last year.

The exhibit of complete launches, marine engines and yacht and engine appurtenances shows a marked growth over last year, and the yachtsmen in search of a launch or a motor will have before him actual specimens of the best that the country affords.

The special yacht club nights, inaugurated last year, will be repeated; each night being devoted to a certain number of the three hundred odd yacht clubs of the United States and Canada, to whom invitations have been sent. The presence of the flag officers or other representatives of each club will be indicated by the hoisting of the club burgee in the Garden.

Much has been done within the past year in the improvement of the usual type of launch motor and the further development of the new auto-marine type, and even those who are best informed as to this progress will be surprised at the result when all engines are brought together under one great roof.

The other features of the show, though less conspicuous than of old, have by no means been neglected; tents, camp fittings, portable lodges, and all implements of hunting, fishing and canoeing will be shown, with many interesting exhibits of natural history.

Sintz and Cock Two-Cycle Engine Patents.

PATENT litigation with considerable complication as to priority of invention is apparently probable, owing to the fact that owners of two patents, each claiming to cover broadly the two-cycle, three-port type of explosion motor, are endeavoring to enforce their claims, offering to license American manufacturers to build motors of this type. As reported in THE AUTOMOBILE a few weeks ago, Joseph Day, an Englishman, came to this country a short time ago and offered for sale the American rights to manufacture two-cycle, three-port motors under a patent issued to F. W. C. Cock; the English patent was dated October 15, 1892, and the United States patent was applied for March 10, 1894, and granted August 6, 1895. Day had made considerable progress in interesting manufacturers in his claims and returned to England, when James Whittemore appeared with a patent issued to Clark Sintz, of Springfield, O., on November 21, 1893, application having been filed October 27, 1892. The Sintz patent apparently covers an engine of the same type, so far as the essential features of the three-port system are concerned. Sintz also filed at the Patent Office an affidavit to the effect that he constructed an engine on the three-port plan, essentially the same as the one shown in the Patent Office drawings, previous to May 1, 1892.

Patent attorneys have been retained by interested parties, and the manufacturers of two-cycle, three-port motors are awaiting the results with much interest. Mr. Whittemore has issued a letter to manufacturers, setting forth his claims and offering licenses under the Sintz patent and expressing the intention of enforcing his rights in the courts if necessary.

Following are the claims of the Sintz patent, owned by Whittemore:

1. In a gas engine cylinder having supply and exhaust ports, and a moving piston in said cylinder adapted to alternately open said supply and exhaust ports to opposite ends of said cylinder, and a communicating chamber, adapted, by the movement of said piston, to be opened simultaneously to the opposite ends of said cylinder and thus form a communication from one end of the cylinder to the other, substantially as specified.

2. In a gas engine, a cylinder having supply and exhaust ports arranged near the center thereof and approximate to each other, and a piston adapted to normally close both of said ports, said piston being adapted to uncover one of said ports and cause it to communicate with one end of the cylinder, as it approaches the limit of its movement in one direction, and to uncover the other port and cause it to communicate with the opposite end of the cylinder, as it approaches the limit of its movement in the other direction, and a communicating chamber adapted to form a communication from one end of said cylinder to the other, as the piston reaches the limit of its movement in one direction, substantially as and for the purpose specified.

3. In a gas engine, a cylinder, a moving piston therein, supply and exhaust ports

arranged on one side of said cylinder, a chamber *h*, on the opposite side, a port *h'* controlled by the piston communicating directly with the cylinder from said chamber, when the piston is at the limit of its downward stroke, an opening in the wall of the piston and a second port from said chamber *h* communicating with the opening in the wall of the piston when said piston is at the end of its downward stroke, whereby communication is made between the ends of the cylinder around the piston head, through the chamber *h*, substantially as described.

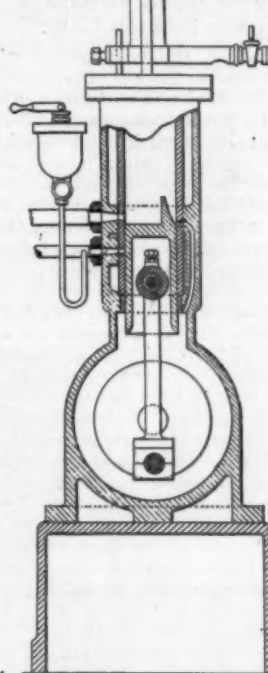
4. In a gas engine, the combination with the cylinder and the moving piston therein, of supply and exhaust ports arranged on one side of the cylinder, and the communicating chamber having ports on the opposite side of said cylinder, and an opening through the walls of said piston adapted to form a communication with said chamber, and thus establish a communication from one end of said cylinder to the other, the exhaust port being arranged slightly in advance of the port which opens through the cylinder to said communicating chamber, so that the exploding chamber is permitted to exhaust prior to the time the charge is admitted thereto, substantially as specified.

5. In a gas engine, an electric ignitor consisting essentially of an insulated electrode extending through the cylinder head, a rock-shaft arranged at right angles to said electrode extending through the cylinder walls and carrying on its inner end a rocking bar which is arranged within the cylinder and adapted to normally contact with the electrode, a projecting arm on said rock-shaft on the outside of said cylinder, and a spring extending from said arm to a stationary connection on the outside of said cylinder, so as to hold the rocking bar in contact with the electrode, said rocking bar being adapted to contact with the moving piston and break the contact with said electrode, substantially as specified.

6. In an explosive engine and in combination, a piston, and a cylinder having a direct supply and an exhaust port both arranged to be closed by the piston on its upward or compression stroke and to be opened by the piston at the limit of its power or down-

ward stroke, the said ports being opened and closed successively by the movement of the piston, substantially as described.

F. W. C. COCK.
GAS ENGINE.
No. 544,210. Patented Aug. 6, 1895.



Witnesses:
J. H. P. Smith
J. M. Smith
Inventor:
F. W. C. Cock
By J. M. Smith

COCK THREE-PORT TWO-CYCLE ENGINE
PATENT DRAWING.

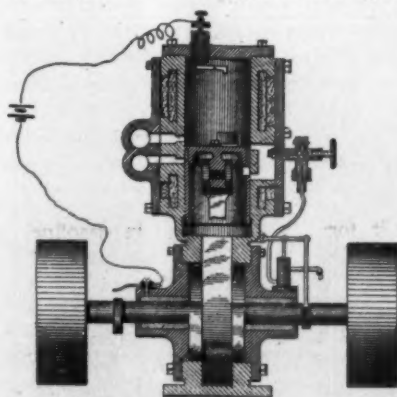
7. In an explosive engine and in combination, a piston and a cylinder, an exhaust port in said cylinder opened by the piston before the limit of its downward or power stroke, an indirect supply port opened by the piston at the limit of its power stroke and a direct supply port connected with the indirect supply port leading to the opposite end of the cylinder, the said piston being arranged to close the exhaust and indirect supply ports successively at the beginning of its upward or compression stroke and to open the direct supply ports only at the limit of its downward or power stroke, all substantially as described.

8. In combination in an explosive engine, a cylinder having an exhaust port and a direct supply port arranged to be opened successively by the piston at the end of its down or power stroke, communication between the direct supply port and the opposite end of the cylinder, through an indirect supply port, and a piston having an opening arranged to form connections with the supply ports at the end of the power stroke, substantially as described.

9. In combination in an explosive engine, a cylinder having an exhaust port and direct supply port both arranged to be opened by the piston at the end of its down or power stroke, communication between the direct supply port in the cylinder below the limit of the upward or compression stroke, and a piston having an opening arranged to connect with the direct supply port at the end of the power stroke, said piston in its movements covering and uncovering all the ports, substantially as described.

10. In combination in an explosive engine a cylinder having an exhaust port and supply port, a direct supply port leading to a chamber which is also in connection with the interior

C. SINTZ.
GAS ENGINE.
No. 509,255. Patented Nov. 21, 1893.



Witnesses:
H. B. Bradshaw
Frank Hatt
Inventor:
Clark Sintz
By J. M. Smith

SINTZ TWO-CYCLE GAS ENGINE PATENT
DRAWING.

of the cylinder, and with the gas or other explosive supply, and an indirect supply port having connections with said chamber, and a piston arranged to open and close said ports and to draw and force the supply substantially as described.

Following are the claims set forth in the United States patent issued to Cock:

1. In a gas engine, the combination of a cylinder and a piston therein, the cylinder being divided by the piston into a combustion chamber and a compression chamber, and a passage connecting the two chambers, the said passage being opened and closed by the piston, with air and gas inlet ports opening into the compression chamber, the said ports being covered and uncovered by the piston itself, substantially as set forth.

2. In a gas engine, the combination of a cylinder, a compression chamber at one end thereof, a piston adapted to reciprocate within the cylinder and to compress the explosive mixture in the compression chamber during its downward or outward stroke, a port or passage leading from the compression chamber into the cylinder, its lower end being adapted to remain constantly open and its opposite end adapted to be closed by the piston from near the beginning of its inward stroke until said piston has nearly reached the limit of its outward stroke and to be opened when the piston is completing its outward stroke, air and gas inlet ports leading into the cylinder and adapted to be closed by the piston from near the beginning of its inward stroke until near the completion of its return or outward-stroke, and an exhaust port communicating with the cylinder and adapted to be closed by the piston from near the beginning of its inward stroke until near the end of its return or outward stroke and to be opened while said piston is terminating its outward stroke and during a portion of its inward stroke, all substantially as described, for the purpose specified.

ELECTRIC VEHICLE ORGANIZATION.

The Electric Vehicle Manufacturers' Association was formally organized at a meeting held in Chicago on Friday, February 9, when officers were elected as follows: President, George Pope, Pope Manufacturing Company, Hartford, Conn.; vice-president, George N. Studebaker, Studebaker Automobile Company, South Bend, Ind.; treasurer, M. L. Goss, Baker Motor Vehicle Company, Cleveland, Ohio; secretary, Robert McA. Lloyd, Vehicle Equipment Company, New York.

DEALERS' ASSOCIATION EXPANDS.

Headquarters are to be opened by the National Association of Automobile Dealers in the Prudential Building, Buffalo, with W. R. Densmore, formerly of the Packard Motor Car Company, in charge, as business manager. The association recently decided to open its membership to all dealers and thereby become national in scope as well as in name.

Mark Twain, the noted humorist, suggests that the word "chauffeur," the correct pronunciation of which puzzles so many, be abolished for the adoption of the word "mahout." Will Mr. Twain please give the proper pronunciation?

The Kaiser's Automobiles.

PARIS, Feb. 4.—Werner, the favorite chauffeur of the late Clarence Grey Dinsmore, now in the service of Kaiser Wilhelm II., has charge of a splendid selection of royal automobiles. According to the correspondent of the European edition of the *Herald*, the German Emperor possesses in his private garage six touring automobiles and two luggage wagons; in addition three new Mercedes machines have been ordered from the German Daimler company and are expected to be ready for delivery in about two months.

No. 1 automobile was constructed by the Neue Automobil Gesellschaft, with body work by Neuss & Co., of Berlin. It has four cylinders and develops 20-24 horsepower. The color is delicate ivory white, picked out in black and fine lined gold, the under carriage being dark blue picked out in gold. Interior trimmings are in shiny claret morocco, with pile carpets, and there is seating accommodation for four. Magnificent brass searchlights, surmounted by massive gold crowns, are fitted in front, and on the rear panel an enormous crown more than a foot square is painted in brilliant colors, in place of the usual police number.

No. 2 is the Mercedes automobile formerly owned by Mr. Dinsmore and purchased after his death by the Emperor. This machine was loaned to the Emperor by Mr. Dinsmore during the last army maneuvers, as the royal vehicles were not sufficiently powerful for the hilly ground. The automobile is now painted ivory white, blue and gold and is trimmed with bright claret morocco. Its extreme length renders it somewhat unwieldy, and for this reason it is not a general favorite in the garage.

No. 3, the Emperor's favorite machine, is a four-cylinder, 40-45-horsepower Fiat, with side-entrance, double-phaeton body and Cape hood. It is painted in claret picked out in black and fine lined gold. No coronet is placed on the doors, the only external mark of proprietorship being the large crown fixed behind to satisfy the police regulations. It was in this automobile that the Emperor took his famous fast run on July 17, covering 200 miles at an average speed of fifty-nine miles an hour.

No. 4 machine is a Mercedes-Daimler double tonneau with four-cylinder engine developing 28-32 horsepower.

No. 5, also a Mercedes, has a coupé-limousine body by Neuss. Its four-cylinder engines develop 40-45 horsepower.

The Emperor employs seven chauffeurs in all, the two head ones being Schmidt and Werner. A special kind of uniform is worn when the Emperor is being driven, consisting of brown cloth with broad gold braid, on which the black Prussian eagle is liberally embroidered; knickerbockers and top boots. An epaulette is attached to the right shoulder and a badge on the right sleeve, both being worked in red and gold.

The imperial garage forms part of a mag-

nificent pile of buildings opposite the royal castle, which was completed a few years ago for the housing of the hundreds of Emperor William's equipages and horses. The space set aside for automobiles no longer suffices, and when the three new Mercedes machines arrive fresh space will have to be allotted for them. The garage is equipped with turning lathes, boring machines, vises, etc., at present worked by hand power. An electric motor will be installed shortly in order to drive the different machine tools.

COURT DECISIONS.

A decision of interest to dealers has been rendered in the Superior Court in Montreal by Judge Dunlop, in a suit brought by the Eastern Automobile Company against André Gagnon to recover the price of a second-hand Orient buckboard that had been sold and shipped by the plaintiff to the defendant.

Gagnon accepted delivery of the machine and used it for two days. Not being able to run it successfully, he shipped it back to the company, which refused to accept delivery of it and brought suit. Gagnon brought a counter-suit to annul the sale. As Gagnon was not able to prove that the machine was mechanically defective in any way, judgment was rendered condemning him to pay the full price at which the machine was sold to him, together with costs of the action, and his counter-action for annulment of the sale was dismissed with costs.

* * *

A case of considerable interest to the automobile dealers and autoists was decided in the Rochester Municipal Court recently, when Judge D. C. Hebbard entered judgment for the plaintiff for \$150 and costs in an action by H. D. W. Mackaye against Thomas J. Northway. Some time ago Mackaye bought an electric car from Northway for \$200, with a deed of warranty. Mackaye said he had run the machine about twenty-five miles since he had it and that he expended over \$50 for repairs which did not put the machine into condition. Several of the large firms here overhauled the machine and attempted to ascertain and remedy its faults, but without success. It was upon this evidence that Judge Hebbard entered judgment.

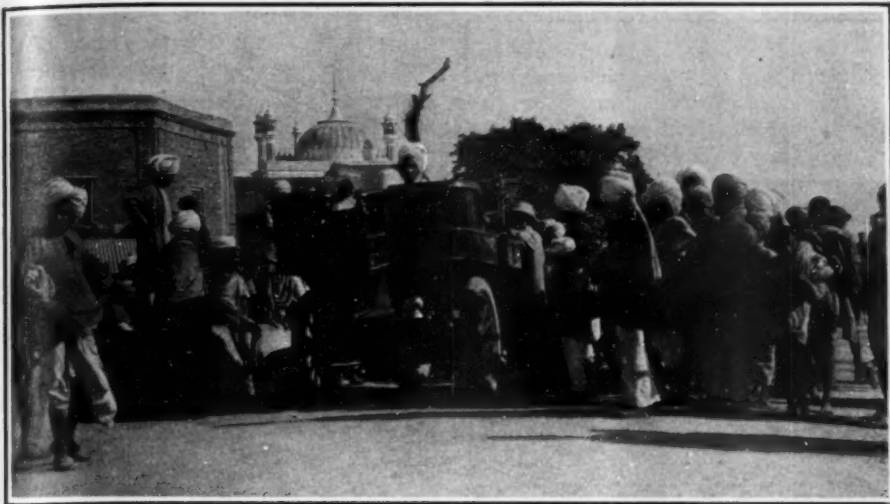
Careful attention should be given to the matter of keeping the bolts in the differential case well tightened on such cars as have the differential in the rear axle. Nearly all of the more pretentious cars have lock-nuts of some form to retain the bolts, but some of the lower-priced runabouts are not so provided. As the alignment of the rear axle depends upon keeping the bolts of differential case tightened, one can unthinkingly get into serious trouble by neglecting to examine the bolts frequently. The axle will begin to sag at the center and cause binding of the differential gears and the axle bearings.

Round the World with Glidden.

Charles J. Glidden, the round-the-world tourist, found, of the 4,405 miles which he covered in India, only 120 miles of bad high-

February 12 to Colombo, Ceylon, thence to Singapore, Siam, Corea and Japan.

Mr. Glidden expects to return to the



IN BENARES THE NATIVES TOOK A GREAT INTEREST IN THE ROUND-THE-WORLD CAR.

way. His drive was the longest ever made in India, and began at Bombay, December 1, went as far as Mahabeshwar, then northward through Agra, Delhi, Auritsar, Poshawar to Landi Kotal, returning to



MR. GLIDDEN TAKES AN ELEPHANT RIDE.

Agra, thence to Lucknow, Cawnpore, Allahabad, Benares, to Calcutta.

India possesses what is known as the Grand Trunk road, which is designated by Mr. Glidden as the equal of any highway which he has met in the world; in fact, the tourist designates the Indian roads as "wonderful," possibly because he did not expect to find anything of the sort. British occupation accounts for the excellent roads in India, and they have been constructed wider than the average road in Great Britain.

The Gliddens were scheduled to sail from Calcutta for Burmah January 28, going

United States about July 1 in time to participate in the second annual A. A. A. tour for the Glidden trophy.

President John Farson, of the A. A. A., will probably announce the new touring committee at the March meeting of the Board of Directors, and this committee will immediately begin preparations for the event, which promises to be an even greater success than the tour of last year.

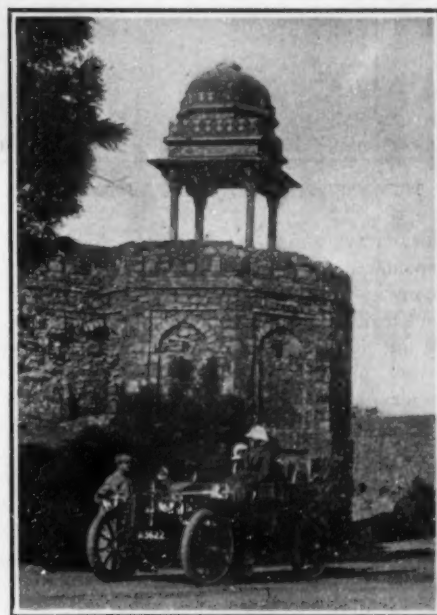
The Western clubs intend to ask that the tour begin at Chicago instead of Buffalo, which, however, is wanted by the Westerners as one of the night stopping places. From Chicago to Boston has been a route suggested, to be followed by a supplementary run into the White Mountains.

Club Fete in Paris.

PARIS, Feb. 5.—The Automobile Club of France has decided to organize an important

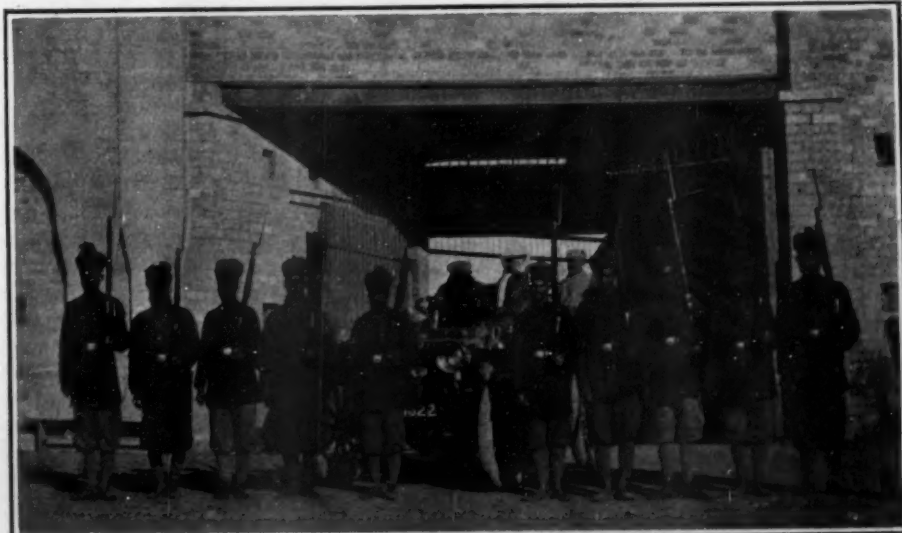
fête in Paris on the eve of the great horse race at Longchamp for the Grand Prix of the city of Paris. The first Sunday in June has for years been the culmination period in the fashionable life of the French capital, for on that date the national race for the Grand Prix—a horse race which must not be confounded with the automobile race of the same name—brings together the richest, most fashionable and most cosmopolite crowds the world can produce. From 1906 onward there will be an additional event.

The program of the club's fête, which will be held on Saturday, June 9, consists of a gala performance at the national opera house, external and internal illumination of the opera, decoration of the streets in the vicinity of the opera house, such as the Rue



INDIA POSSESSES MANY TOWERS.

de la Paix, Avenue de l'Opera, Rue Royale, Boulevard de la Madeleine, etc., and the ceremony of crowning the Queen of the Rue de la Paix during the gala performance at the opera.



THE GLIDDENS ARE GIVEN, WITHOUT ARREST, AN ESCORT OF NATIVE INFANTRY.

Florida's Good Roads Building.

MIAMI, FLA., Feb. 17.—According to New Jersey standards, the road that stretches from Palm Beach to this tropical place.

Coquina shell material is to be found in some parts of Florida, but the greater portion of the Palm Beach-Miami road con-



THE CONVICTS WHO WORK ON THE ROADS ARE HEALTHY AND ENJOY BEING OUTDOORS.

sixty miles and a bit more, would not be considered anything extraordinary. But down in this country it is looked upon as an excellent beginning for the many miles of fine highway that Florida will possess before many years have passed, if the prophecies of its good roads advocates come true.

Everybody who tours in Jersey knows Zacharias of Asbury Park, and "Zach" has wagered on the automobile future of the "Land of Flowers" by taking a winter residence at Miami, where his garage is prospering to a marked degree.

In the construction of this passable highway along the coast there has been employment of convict labor, with probabilities of its greater use all over the state.

tains coral rock, which is exceedingly plentiful.

The highway is narrow, but, as one enterprising resident remarked, "It certainly is a beginning and can be widened at slight expense," something which H. M. Flagler, "the King of Florida," says will be done another year.

Ultimately the entire East Coast of Florida, from Jacksonville to Miami, will have a road that will furnish the most tropical automobile tour in this country. In addition there will be crossroads into the interior, and even one that will continue to Tampa on the West Coast.

Jacksonville has invested extensively in improved roads, and Daytona and Ormond have been equally progressive. Orlando is an interior town that has done its share

of the work, and all over the state recently there has been a widespread discussing of ways and means for bringing about that which all desire, even to the farmer whose sleepy mules give slight heed to the comparatively new user of the Florida highways and byways.

Unquestionably it is to the coming of the automobile that Florida owes its renewed interest in good roads, though it had its pioneer advocates in this field many years ago, one of the most energetic of which was, and still is, Senator A. S. Mann. Frank Bond, of Deland, is another persistent shouter, but now there could be many new names added, whose interest is of recent date—wealthy Northerners who have winter homes in Florida and have brought with them the modern means of individual transportation.

GOOD ROADS ACTIVITIES.

John Brisbane Walker, one of the honorary members of the Automobile Club of



VERY OFTEN THE ROAD IS NARROW.

America, delivered an address Tuesday evening, February 20, on the proposed highway between New York and Philadelphia. This is a matter of great interest to the members of the A. C. A., and a large number listened to Mr. Walker's excellent talk.

* * * *

A committee representing the New Jersey Automobile and Motor Club presented to the Hudson county (N. J.) board of freeholders last week a copy of a resolution requesting the board to widen the Newark plank road across the Jersey meadows to 125 feet. The resolution set forth that the roadway affords the only means of direct communication between Newark, its park system and the suburbs of Newark with Jersey City and the Hudson county boulevard and Manhattan, and that in the construction of this road ample provision should be made, not only for the commercial and teaming interests of Newark, but also for light driving and automobiles.



PICTURESQUE STREAMS ARE CROSSED ON THE ROAD FROM PALM BEACH TO MIAMI.

A DISCUSSION OF THE 1906 CHASSIS.—II.

By FORREST R. JONES, M.E.

(Concluded from page 342, issue of February 8.)

THE Hooke universal coupling is still more used than any other type for securing flexibility between the sliding gears and the rear axle, and also between the engine and change gears, although modifications of the form are appearing which are more compact, and fully as powerful. A flexible-disk positive coupling of a general form, long since used on the propeller shafts of steamships, has been brought into service, such as has been more exclusively performed by the Hooke coupling heretofore in automobile practice. The flexible-disk joint has the advantage of no rubbing of parts over each other, and, consequently, no need of lubrication, always a somewhat difficult and neglected necessity in the Hooke coupling.

POSITIVE COUPLING.

Fig. 1 shows the older and more usual form of Hooke coupling, two of which are generally used on the propeller shaft. It may be noted that the yokes at the ends of the intermediate shaft are so related that if the latter is placed on the floor it will lie flat; in other words, the two yokes are in the same plane. This is necessary to prevent uneven or jerky motion at the driving shaft, which connects with the gears on the rear axle. In the arrangement shown, as the driving shaft rotates at a uniform speed, the intermediate shaft first runs ahead of the driving shaft, and then drops behind it during each revolution. If the yokes on the intermediate shaft were placed at right angles to each other, the driving shaft would have twice as uneven a motion as the intermediate. The arms of the cross which connects the yokes are at right angles to each other and lie in the same plane. The intermediate shaft must make equal angles with the driving and driven shafts.

One modification of the coupling shown is secured by replacing the cross by an outer casing, in which the parts corresponding to the yokes have bearing and are free to slide with the motion the same as when the cross is used. Another modification of the coupling is shown in Fig. 2, where a thin steel disk is fastened to the end of each shaft where they are to be connected, and two lugs extending out on the disk are used to connect it to a sleeve which transmits the power from one shaft to the other. This gives a flexible coupling without rubbing parts and consequent freedom from wear, which answers perfectly when the angle between the shafts connected is slight.

In the Hooke coupling and its modifications the axis of the two shafts must always intersect at the same point; therefore two of the couplings with an inter-

mediate shaft must be used for connections where there is considerable motion sideways of the driving relative to the driven shaft.

The Oldham coupling differs radically from the Hooke, both in design and application. It is primarily intended for connecting two shafts, both of which are rigidly supported as to direction, but which may have side motion in relation to each other, while the axes still remain parallel to each other, or come in line, as the case may be.

The Oldham coupling consists of a disk, as shown in Fig. 3, with a groove extending across the center of each side, the grooves being at right angles to each other, and which connects with the enlarged ends of the shafts, each having a tongue to fit into one of the grooves of the disk, which lies between them. The angular velocities are always kept the same with the Oldham coupling. As a matter of fact, although it is not intended to allow the shafts to get out of parallelism, it will work satisfactorily when they are slightly at an angle, provided

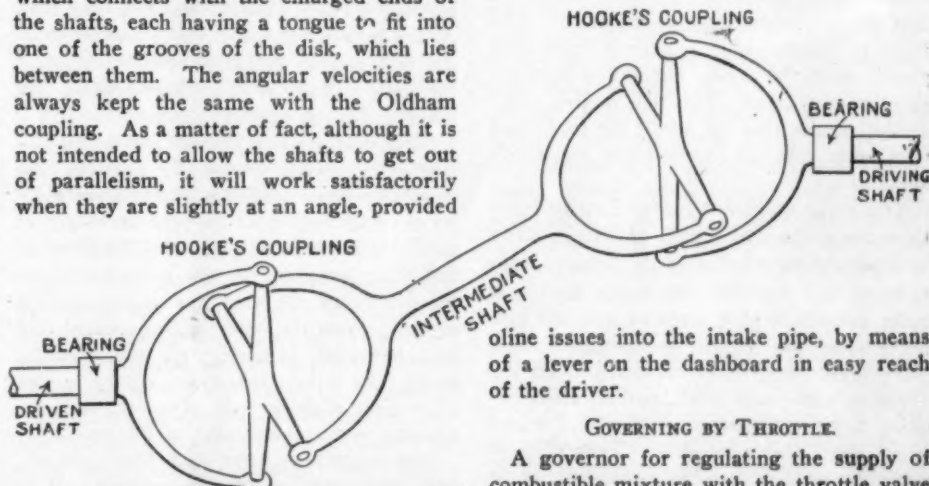


FIG. 1.—POWER TRANSMISSION SHAFT SHOWING USE OF HOOKE'S COUPLINGS.

the faces of the disk are somewhat crowned and the tongues fit somewhat freely in the grooves.

The torsion rod for resisting the turning effort of the rear axle in cars driven by a propeller shaft does not seem to have increased in use. It has been discarded from some cars and added to others. It is perfectly possible to make the connection between the springs and rear axle strong enough to obviate the necessity of its use.

In the differential bevel gears are used somewhat more than spur, although the latter are probably more durable for the same weight. With them, however, twice as many planetary gears must be used as with the bevel, which means from two to four more gears in the case, but the spur gears are free from end thrust, which is the real objection, if any, to the bevel gears.

About 50 per cent. more cars are direct driven by propeller shaft, acting through bevel gears and live rear axle, than by double chains from a countershaft to the hubs of the rear wheels.

Carbureters are extremely varied in type, and the indications are that the one which is even satisfactorily near to perfection has not yet arrived. With few exceptions but one gasoline outlet into the intake is used, although two outlets, one for light load and the other for heavy, only one operating at a time, appear. Even on the best cars some are very simple, while others show great complication with numerous adjustments. Many have both hot- and cold-air intakes with adjustments for both, one adjustment often being in reach from the driver's seat. More unusual is a means of adjusting the size of the aperture through which the gas-

oline issues into the intake pipe, by means of a lever on the dashboard in easy reach of the driver.

GOVERNING BY THROTTLE.

A governor for regulating the supply of combustible mixture with the throttle valve is much used. The valve is usually balanced. In connection with it is an accelerator pedal for throwing the governor out of action in order to rapidly increase the speed or to run faster than the governor will allow when in action. The accelerator is generally operated by foot.

The compression system of supplying gasoline from a tank suspended under the frame of the car back of the rear axle is quite common practice for large cars. In some it is necessary, when starting the car after standing over night, to raise the pressure over the gasoline by means of a hand pump, which is usually located on the dashboard. In others, however, an auxiliary reservoir of small capacity is placed on the dashboard. It holds from a pint to a quart of gasoline, which is sufficient for starting the car and running it until compression is high enough in the large reservoir at the rear. Compression is maintained in the reservoir by a small pipe connecting with one of the exhaust pipes through a check valve. While there might be danger of igniting the gasoline if a large pipe were used from the exhaust to the tank, especially in the

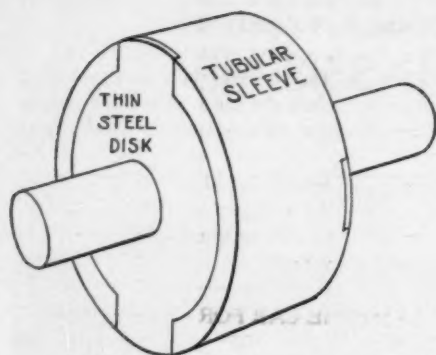


FIG. 2.—MODIFICATION OF HOOKE'S COUPLING.

case of a few misfires and consequent filling of the compression pipe with a combustible mixture, this danger is entirely obviated by the use of a pipe with so small a bore that the cooling effect of its walls will extinguish any flame that may start through it from the exhaust pipe. The check valve is itself an obstruction to the passage of the flame. Wire gauze is sometimes used as a further insurance against accident. The time of danger with a large compression pipe is when the engine is running with the gasoline tank open. This will seldom occur except at the time of filling the tank, and then only through carelessness or ignorance.

The jump spark has received more favor than the make and break, although by no means to the exclusion of the latter. Both systems are installed on many cars. A make-and-break plug screwed into the cylinder after the manner of a high-tension jump-spark plug, differs radically from the ordinary make and break, and does not require more mechanism than the ordinary jump spark for operating. This plug is probably well known as consisting of a solenoid surrounding a plunger which extends into the cylinder, and is held against a bridge across the inner end of the plug by a spring at the back of the plunger. When the plug is screwed into the engine there is a complete metallic protection of the wires of the solenoid coil from the heat and pressure in the cylinder. Direct current is used, which, by passing through the solenoid at the instant a spark is to be formed, draws the plunger back against the expansive force of the spring and opens up the contact between it and the bridge, thus forming an arc. As soon as the solenoid current is interrupted the spring forces the plunger back into contact with the bridge, where it remains until the time for another spark. The self-induction of the solenoid draws a sufficiently long arc at the break. Demonstration shows that even when the contact points are completely surrounded by a globule of thick oil, a strong arc is still drawn when they are separated.

While the direct current interrupted by breaking contact has been found more satisfactory for stationary gas and gasoline engines, and may in itself be more reliable for automobile motors, yet there is the serious

objection of multiplication of parts in the ordinary type, such as an extra camshaft, together with rods and levers, as well as the moving part extending through the cylinder walls, all of which wear and may get out of adjustment. This is what has doubtless prevented the adoption of the system to a greater extent.

HIGH-TENSION DISTRIBUTOR.

The high-tension distributor, using only a single induction coil for all cylinders appears more frequently than formerly, replacing to some extent the induction coil for each cylinder; that is, four coils for four cylinders, etc. The fact that in the single coil high-tension distributor system a space is usually provided for a reserve coil, indicates that there is some doubt of the advisability of relying upon a single coil. With this safety precaution, the distributor system is therefore really reduced to two coils rather than only one, with a reserve capacity for running all cylinders equivalent to that in the individual spark coil ignition system. The elements entering into the choice between the distributor and individual coil system seem to balance about in the same manner as in the high-tension and make-and-break ignition schemes.

Steel contacts in the make-and-break system have almost completely replaced the more expensive platinum and iridium platinum points that were thought necessary in earlier practice. This follows the lines of stationary practice. A few protected high-tension plugs are shown with a porcelain protector over the outer end to prevent dirt and moisture gathering on the metallic parts. The wire connections are by means of a plug slipping into place through an opening in the lower side of the protector.

The magneto is more used than ever for both high and low-tension ignition. It is the ideal method, since the life of the magneto is practically unlimited and it removes all the troubles of run-down dry cells and storage batteries. For make and break, the ordinary direct current type with commutator for rectifying the current is used. A kick coil in the circuit gives a better arc than is obtainable without it. For high-tension ignition an alternating current generator in connection with an induction coil,

the latter either as a separate part such as is used for battery ignition, or as a component part of the generator, is adopted. When the induction coil is separate from the generator, a battery is generally provided for starting the engine. But with all parts embodied in the generator, the timer included, the construction is generally such that no battery is needed, since the magneto will give a spark at the speed that can be obtained by cranking the engine at the start. No particular location has been arrived at for the magneto, although it is more frequently placed somewhere along the right-hand side of the motor, and driven either by spur gears or chain from the crankshaft or camshaft.

The levers for controlling the spark and throttle are placed above the steering wheel in nearly all cases, so as to have the same direction of motion as a wheel. In the foreign machines, the so-called quadrant is generally attached to the steering wheel and turns with it, while in nearly all American machines the quadrant remains stationary when the wheel rotates. The latter method is by far the more preferable. The "quadrant" is really often a semicircle or complete circle. It is usually notched after the manner of the comb of a tiller-steered sailing vessel.

A circuit breaker placed in easy reach finds considerable use for opening up the circuit in order to stop the motor, either in emergency or for retaining cylinder charges to start on compression. An ordinary push button or a pull switch on the steering column seems to have found most favor.

ELECTRIC WIRING OF CHASSIS.

The electric wiring of the chassis has followed the same steps as in the electric motor for street railway practice. At first it was run carelessly and was consequently subject to wear against the parts with which it came in contact, and trouble followed with the destruction of the insulation. On several cars the wires are now either bound tightly against the parts of the machine, run through tubes, or held in place by insulating brackets, so that there is no chafing against metallic parts that would ultimately produce short circuits or grounds.

The pumps for circulating cooling water are all rotary, but of diversified types. A centrifugal pump is more used than those having a fixed volume per revolution. While the centrifugal pumps do not from their nature differ radically in types, the fixed volume pumps are of many varieties. The necessity of rubbing parts and close fits in the latter seem to give preference to the centrifugal pump, which does not require such fits. Some makers have found it necessary to place check valves at the pump in order to prevent steam getting back to it when the engine becomes highly heated, and especially when it is stopped while at a high temperature. The pumps are nearly all gear driven when not directly attached to the crankshaft or one of the camshafts. Chain drives are used to some ex-

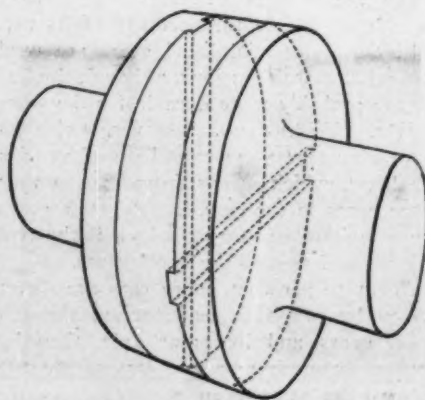


FIG. 3.—OLDHAM COUPLING.

tent. The location of the pump is not on any particular part of the motor when one considers general practice. In a few cases the pump and magneto are on the same shaft.

Radiators are of all types with a capacity generally of three to four gallons, and are so well known that they hardly need description.

A safety ratchet for holding a car from running backward down an incline has been attached to many cars either on the propeller shaft or counter shaft. It affords a means of letting off the brakes completely before starting the car, and makes it safer to leave a car without a guard, since it removes the danger of its running backward if the brake is mischievously released.

IMPROVED STEERING CONNECTIONS.

The old form of connection at the ends of the steering rod and distance rod of the steering system as used on several cars was liable to drop the rod if considerable wear had occurred and no adjustment made to compensate for it. It has been replaced by designs giving greater safety.

There is a further cause of reducing the effort required at the steering wheel for swiveling the road wheels, however. Remembering that the two knuckle arms to which the distance rod attaches are farther apart at the end than the distance between the swivels when placed in front of the axle, and nearer together when placed back of the axle, it can be seen that when the wheels are swiveled, the rod will be drawn out farther away from the center of the swivel pin on the knuckle, which carries the wheel whose forward portion is brought in toward the fore and aft center line of the car. This throws out of balance the efforts of the wheels to swing backward when running forward, and the force applied at the steering wheel must overcome the lack of balance, which is proportional to the distance d or $d/2$, according to the distance from P to the axis of the pin (Figs. 2 and 3, February 8), and is therefore only half as great when the wheel is tilted as when straight. Again referring to the sketches, it may be noted that by tilting the wheel still farther or bringing the swivel out nearer to the center of the wheel, the distance d may be reduced to 0, and then there will be no side pressure on the pin, and no tendency for the wheel to throw the swivel backward when the car is running forward. The effort required of the steering wheel would therefore be reduced to the minimum attainable amount.

Leaving the wheel vertical and inclining the pin does not reduce the pressures on the side of the latter.

The automobiles of 1906 are better constructed for strength and durability, both points in favor of reduced time and cost for repairs. The changes of design that have made more easy access to the parts requiring periodical examination, and greater ease of removal for repairs, are well marked

and numerous. One who has lost the use of his machine for days or even weeks while it rested in the repair shop, will heartily appreciate what has been done toward making it possible to keep it in more constant service and prevent vexatious delays while touring.

NEW USE FOR INSPECTION CARS.

MOMENCE, ILL., Feb. 17.—One of the uses now made of railway inspection motor cars is the work of placing block signals. The car is used to transport both men and materials and has been used to great advantage.

The Chicago and Eastern Illinois Railway Company is now equipping its line between Chicago and Terre Haute with these signals. The car used is made at Three Rivers, Mich., and is of 6 horsepower, geared three to one. It has two forward speeds and reverse. It has a ball-bearing friction clutch.

The men who use this car are accustomed to attach a push-car loaded with tools, and a hand-car carrying eight men, to the motor car. This odd train spins along faster than any freight train on the line. The railroad furnishes a pilot, who is given charge of the operation of the car while it is on the rails. The construction men say that it is the most useful machine for the purpose that has ever been used.

YOUTHFUL PACIFIC COAST DRIVER.

One of the youngest drivers of an automobile on the Pacific Coast is the son of W. B. Robb, Rambler agent at Fresno, Cal. Young Master Robb is but fourteen years of age, yet he has been regularly licensed as a chauffeur, and during the busy fruit season last year made a number of long trips with fruit buyers through the country around Fresno. He handles a car with skill and in his experience, covering a period of

several months, has acquired a reputation as a competent and careful driver.

His father, writing about the lad's experiences, states that he has never met with an accident and has always returned on schedule time from the many trips in the big machine. The simplicity of control of the Rambler is demonstrated in the mastery of the machine by a driver so young, although no small part of the credit must be given the youthful chauffeur.

GASOLINE CAR FOR LAKE SHORE.

AKRON, OHIO, Feb. 19.—A mammoth gasoline motor car for railroad service is under process of construction at the plant of the Wellman-Seaver-Morgan Company in this city. It will be 45 feet long. The engine will have eight cylinders and develop 200 horsepower.

The Lake Shore and New York Central railroad companies are having the car built, and will experiment with it with a view to competing for much of the passenger traffic that now goes to interurban electric lines. The car will accommodate practically the same number of passengers as the large trolley cars, and it is claimed that greater speed can be maintained.

S. L. Chase, of Jamestown, N. Y., is the patentee, and the car is being built under the direction of E. L. Smith, also of Jamestown. Should the car prove successful after a thorough trial, the railroads have promised to contract for twenty-five cars to be constructed here by the Wellman-Seaver-Morgan Company.

Spark plugs occasionally fail for no discoverable cause, whether from electrical leakage or a very slight deposit of carbon, or perhaps from some molecular change in the porcelain insulating medium. The only remedy is to discard the troublesome plug and fit a new one.



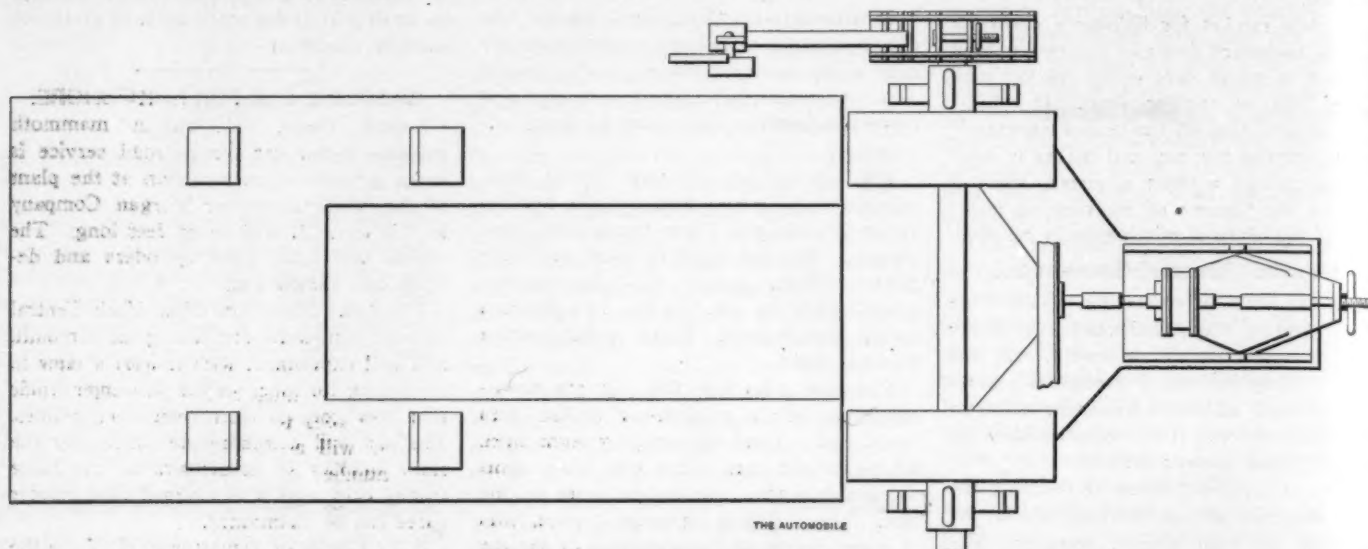
MASTER ALEC ROBB, OF FRESNO, AGED FOURTEEN, DRIVING HIS FATHER'S RAMBLER.

Purdue University Testing Plant.

CLOSE acquaintance with the automobile and intelligent study of its mechanical features invariably engenders respect for the manner in which the problems of mechanical propulsion have

testing plant follows the lines of the Purdue locomotive testing plant, with the modifications necessary to meet the differing conditions. A car to be tested is run up on a heavy platform and its rear wheels backed onto

and the car started. The energy imparted by the rear wheels of the car to the rollers may be absorbed by a friction brake; a scale operated by the brake is read in connection with the dynamometer scale, the latter giving the drawbar pull. The brake pulley is flanged, as the illustration shows, to hold cooling water, and a water



PLAN VIEW OF PURDUE TESTING PLATFORM, FRICTION BRAKE AND DYNAMOMETER.

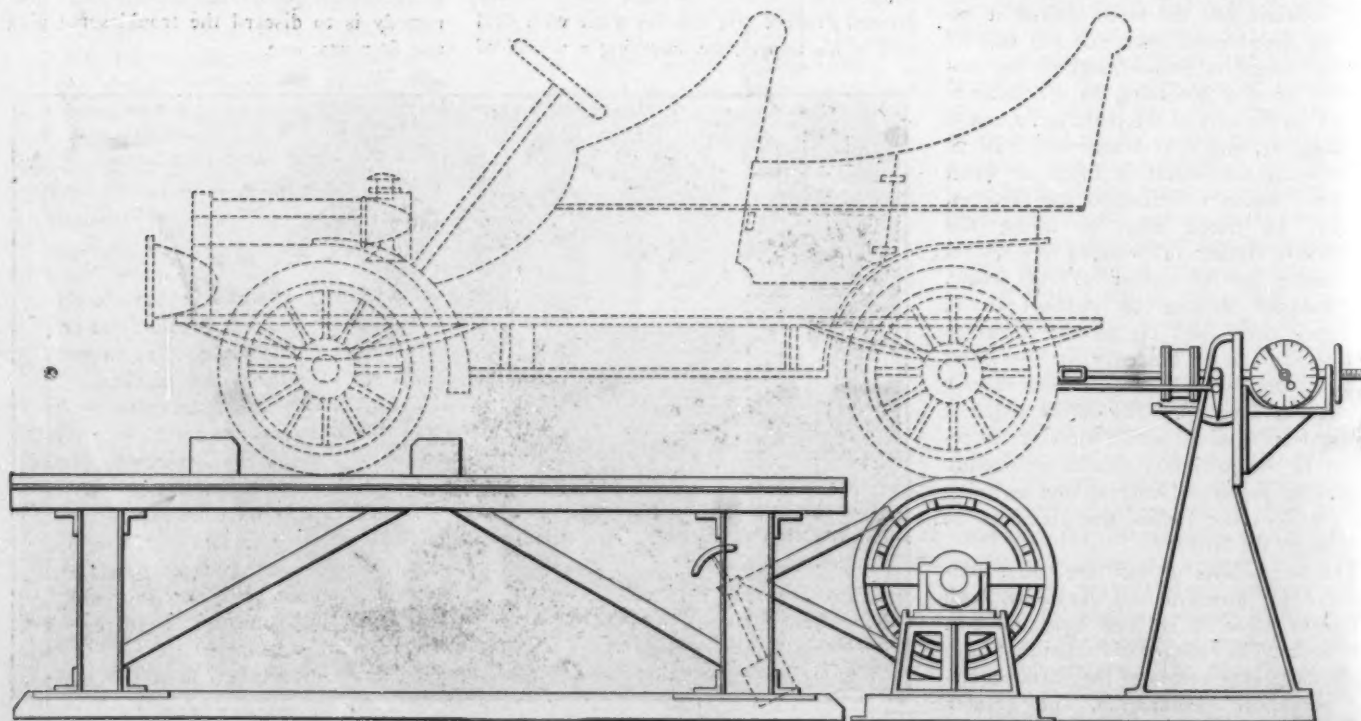
been met. It is therefore distinctly gratifying to all who are interested in the progress of the industry to see the automobile taken up as a subject for serious study and research. The automobile testing plant illustrated herewith has been installed at Purdue University, Lafayette, Ind., and was designed by W. F. M. Goss, Dean of the Schools of Engineering, assisted by Professors McColl and Teague.

In its general principles the automobile

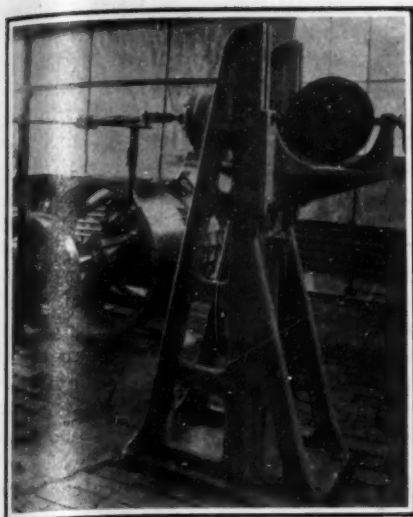
rollers consisting of large wood split pulleys mounted on a shaft revolving in fixed bearings; small bridges are used to get the rear wheels on the rollers. The front wheels are blocked, though a few inches' movement is allowed, and the rear end of the car is held in position by being attached to the drawbar of a traction dynamometer mounted on very heavy cast iron frames at the rear of the testing platform. The bridges can now be removed

pipe and cock are placed conveniently for cooling purposes. A motor driven pressure blower delivers air through adjustable piping for cooling the radiators of gasoline cars or the condensers of steam cars, while an exhaustor with intake near the exhaust outlet of the muffler removes noxious gases from the testing room.

Regarding the action of the apparatus, it is clear that if the rollers supporting the rear wheels were prevented from turning



ELEVATION OF AUTOMOBILE TESTING APPARATUS USED AT PURDUE UNIVERSITY. CAR SHOWN IN DOTTED LINES IN POSITION FOR TEST.



STANDARD CARRYING TRACTION DYNAMOMETER OF PURDUE AUTO TESTING PLANT.

while the wheels of the car were being driven by the motor, the car would tend to move forward with its full tractive energy, even to the extent of slipping the wheels on the rollers, and the pull exerted would be indicated on the dynamometer scale. If the rollers revolved without friction no pull would be indicated by the dynamometer. The rollers are not frictionless, however, but are fitted with a device (the brake) by which the value of the friction may be varied at will and may be measured at the same time. The greater the friction applied to the brake the stronger will be the pull on the drawbar. The energy delivered by the automobile is the product of the draw-bar pull into the distance passed over by the tread of the rear wheel of the car. Thus the horsepower delivered is equal to the pull on the dynamometer in pounds, multiplied by the distance passed over in one minute by the wheels, divided by 33,000. The distance passed over by the rear wheel is determined by means of a revolution counter, the exact diameter of the roller being known.

The testing work for the present winter will include the determination of the power developed by a number of typical automobiles operated under various conditions; the results should be of the greatest interest to owners and manufacturers alike.

A. C. A. TECHNICAL COMPETITIONS.

The Automobile Club of America has decided to offer several trophies as prizes in annual competitions in such parts and fittings as carbureters, bearings, batteries, shock absorbers and anti-skid devices. The special committee, of which George F. Chamberlain is named as chairman, will devise a plan for such competitions and will offer suggestions to the board of governors of the club as to the parts or accessories for which there is most need of encouraging improvement. It is understood that trophies

are to be offered by several wealthy members of the club. President Morris, of the club, says that one of the first competitions may be for the best alcohol motor, and another for improvements in carbureters. He expects much good to the industry to result from these competitions. It is thought that some of the prominent club members will desire to have their names associated with various lines of constructional improvement, just as William K. Vanderbilt, Jr.'s is with speed development.

THE FARMER IS NOW A USER.

INDIANAPOLIS, IND., Feb. 17.—It seems that the old farmers *vs.* automobile question in Indiana is to reach a ludicrous stage and develop a plot that would do credit to a comic opera, for it appears that the farmers are now greatly divided on the question.

A few days ago the farmers in the vicinity of Montmorencie met and adopted several resolutions, one of them being that the automobile should be forever abolished from the highways, or, as a substitute, fix the lawful maximum speed at ten miles an hour. But it happens that a number of very intelligent farmers in the vicinity of Montmorencie own motor cars and the situation is becoming humorous. It was decided to send the resolutions to Governor Hanly, with a request to incorporate them in his next message to the Legislature, but it is highly improbable that they will ever leave Montmorencie.

A canvas of the dealers of the city reveals the fact that a large proportion of the buyers of cars this year have been farmers. In the future it looks as though the narrow-minded farmer would be in the great minority.

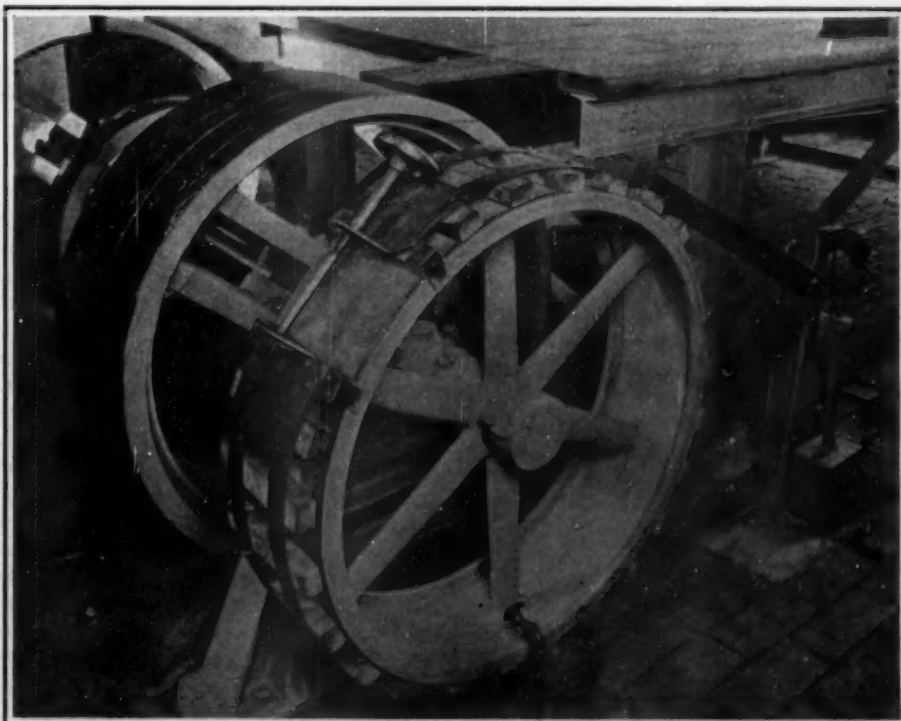
CALIFORNIA AUTOMOBILISTS RESIST.

LOS ANGELES, CAL., Feb. 17.—The hold-up of the automobilists by the local police has about reached its limit. The motorists are tired of paying the \$15 and \$25 fines and will fight in the future. Willie Hook, who was arrested for going over ten miles an hour in Azusa when he has proof that he was moving very slowly, having been warned of the trap, has taken his case to the Superior Court.

James F. Morley, owner of the local baseball club, was arrested a few days ago for going twenty-three miles an hour in his Stevens-Duryea runabout. The car is an old one, and has seen hard usage. Morley fought the case and a jury found him not guilty. After the arrest he left his car in the shop and had it tested the day before the trial. The expert testified that it would not run faster than fifteen miles an hour. Morley offered the car to anyone in the court room who could run it twenty-three miles an hour.

In another case witnesses testified that they had seen the speedometer on the motorcycle used by the police registering six miles an hour while the machine was leaning against a post.

The production of aluminum in the United States has increased nearly ten-fold in as many years, according to the annual report of the Geological Survey for 1904, recently issued. The total output for the year 1904 was 8,600,000 pounds. In 1883, which year marked the beginning of the industry in America, only 83 pounds were produced. Ten years later, in 1893, the annual production had risen to 7,500,000 pounds.



PHOTOGRAPH SHOWING DETAILS OF FRICTION DRUMS AND BRAKE OF TESTING APPARATUS

Tarred Roads in France and England.

The process of applying tar to macadam roads with the object of preserving the surface has awakened so much interest since the publication of illustrated articles on the subject during the last two or three years that Consul-General Robert P. Skinner, at Marseilles, has sent a supplementary report on the subject to the State Department. Regarding the purpose of the treatment of roads with tar, he says:

I endeavored to make it clear that when the tarring of French roads was undertaken it was with the expectation of preserving the surfaces, and only incidentally "for the laying of dust." It seems to me distinctly unfortunate that in the United States so much stress is laid on the dust problem and so little on primary construction and preservation of roads, although it is obvious that a well-built and carefully preserved road is necessarily dustless. The makeshift whereby the common American dirt road is occasionally dosed with tar and greases of various kinds, on the assumption that the French method is being followed, merely defers the proper rebuilding of our highway system.

It must be remembered that France is already endowed with good roads, and that whereas in the United States the automobile has come as an instrument to awaken interest in the subject of highway building, it is regarded by the French road engineer as a destructive agent of roads already good. Moving with great velocity and with closely adhering and sometimes metal-shod tires, the automobile scrapes the fine, hard surfaces like a file, surfaces which would resist years of ordinary wagon traffic. To combat these destructive influences many of the French engineers employ the tarring process, which aids powerfully to prevent the disintegration caused by traffic, and which, unless arrested, makes the dust nuisance acute.

The results of tarring and the effect of weather and traffic on tarred roads are described thus:

VALUE OF HOT TAR.

It has settled down to a positive conviction in France that hot tar applications are valuable in proportion to the excellence of the surfaces upon which they are laid. When well done the tarring gives the effect of an asphalt pavement, and the foothold on a macadamized surface is of course much better than on asphalt. In my previous report mention was made of a city boulevard in Marseille first macadamized and then tarred.

The tar was by no means smeared over the surface like a coat of paint. The work was done in the midst of the dry season, after the road had been carefully swept, and the hot liquid was worked with stiff brushes into the road joints, penetrating to

a considerable depth. The traffic over this boulevard is intense, and consists largely of automobiles moving at their highest speed. After two years' wear no more dust is observable than would be the case with an ordinary asphalt pavement receiving the traffic of innumerable unpaved streets. The surface is intact and the sides, where washing generally occurs, look as fresh and clean after a rain as an asphalt pavement.

It is doubtful whether anything short of a hard pavement can give permanent satisfaction in a large city, but if such work as was performed in marseilles could be undertaken in the open country the road surfaces so treated ought to last for years with reasonable attention.

The Consul-General had received so many inquiries regarding the treatment of the roads that he referred them to M. Girardeau, the French road commissioner, who perfected the tarring method. Some important points to be observed in the process and the cost of treatment are given as follows by M. Girardeau:

It is necessary to first brush the road carefully, barring the pebbles constituting the surface, and then to operate upon a thoroughly dried road, in a good state of preservation. The tar to be distributed should have a temperature of 80 degrees centigrade at least. Per square meter in France an effective tarring costs:

	Centimes.
Tar, 1,200 kilograms, at 40 francs per ton	05
Heating and sand	01
Brooms, labor, etc.....	04
	10
Wear and tear of machinery, sinking-fund and miscellaneous expenses...	05
	—
General total	15
[15 centimes equal 3 cents.]	

TAR MACADAM IN ENGLAND.

An important improvement in the method of making tar macadam roads as extensively practiced in England for several years is reported by Consul Mahin, of Nottingham, as follows:

The treating and mixing of tar macadam was done by hand in this country till Mr. Arthur Brown, the city engineer of Nottingham, co-operating with Herbert G. Clarke, another engineer, invented an apparatus to supersede the crude method of heating granite chips on an iron slab and then mixing them with hot tar, a disagreeable process, which has been found to produce sundry throat troubles. The new apparatus consists first of a hopper, into which the material to be treated is delivered directly from carts or wagons either by tipping or other suitable method. The material is fed into a cylinder from

the hopper by mechanism which regulates at an even rate the supply of the material, slag or otherwise, and delivers it into the cylinder, which is divided into longitudinal compartments and so inclined as to pass through it readily the material delivered into it. It is mounted on antifriction rollers to minimize the driving power. Inside this cylinder is an inner cylinder or trough containing a worm conveyor. Under the apparatus are two combustion chambers in which coke fires are maintained for supplying heat to the outer cylinder and its longitudinal compartments, and also to the outside of the inner cylinder or trough containing the conveyor. These combustion chambers supply heat also to two tanks holding the tar or other mixture, which are situated at the lower end of the apparatus in the form of a saddle over the cylinder. Connected with these tanks are pipes which are coupled to a piece of mechanism for automatically distributing or spraying the tar onto the slag or other material.

OPERATION OF THE MACHINE.

The process is, therefore, as follows: Slag or other material is delivered into the hopper and fed automatically into the longitudinal pockets in the cylinder. As this cylinder is inclined, the material is slowly passed through as it revolves, is thoroughly dried and heated, and then falls into the lower end of the inner cylinder, where it receives the proper amount of tar, and is turned over and mixed in the trough which contains the worm conveyor, when it is delivered at the upper end thoroughly mixed and coated. The quantity of tar is adjusted to the speed of the feed of the machine, and there can be no surplus or deficiency of tar. It is claimed that the inventors have solved the difficulty, never before overcome, of drying, heating, and mixing the material in one apparatus at one operation, and that the cost of the mixing is at most one-fourth the cost of mixing by hand. The process, from the emptying of the granite chips into the hopper until they are ready to be put down on the road, occupying about four minutes. The apparatus is now being manufactured in this city.

ADVANTAGES OF MACADAM.

Respecting tar-macadam roads in general, it is claimed that they give the maximum amount of wear with the minimum amount of mud and dust, and that they reduce to the minimum the tractive force required to haul a load. A good sample of such a road is a favorite drive along the river Trent, which appears to be in perfect condition after five years' use. It is stated that Belgian engineers sent to this country by King Leopold to investigate tar-macadam roads, after visiting several places, pronounced this the best they had seen; and that the eventual result was the construction of a similar road from Ostend to Blankenberg in Belgium, principally for the use of the King in motoring.

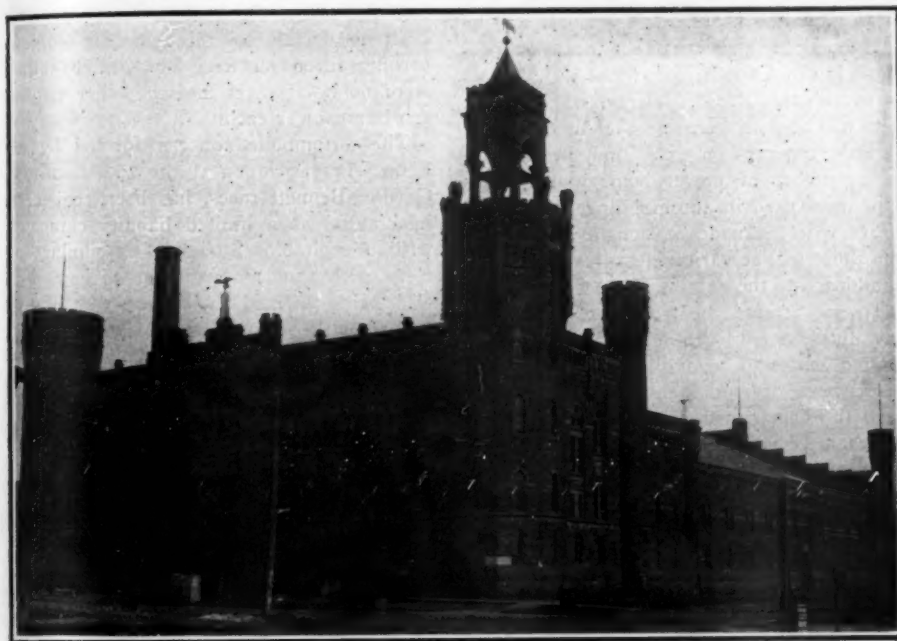
Cleveland Show Opens in Central Armory.

CLEVELAND, Feb. 19.—The fourth annual Cleveland Automobile Show opened tonight in the big Central Armory building, which was the only available building in the city that was large enough to house the exhibition this year. Heretofore the show has been held in the Grays' Armory.

The eager public crowded into the building early and stayed late, admiring the new models of cars and the attractive decorations of the interior of the armory and of the exhibitors' stands. The interior has been remodeled and redecorated throughout, and new floors were laid, the Chamber of Commerce co-operating with three trustees who are acting as lessees. George Collister is acting as manager of the show, the Cleveland Automobile Club, which has had charge of the previous shows, remain-

Instead of having the lights distributed indiscriminately about the armory, all overhead lights radiate from the center of the building in strings reaching down from the center of the roof to each corner of each exhibit on the floor. Much the same scheme is carried out in the galleries.

As a leading automobile manufacturing center Cleveland holds an important place in the succession of winter exhibitions, and the local population is keenly alert to all that pertains to the growth and advancement of the industry. All the new models of the dozen prominent factories located here are to be seen at the show in their pristine freshness, and, for ready comparison, there are the new models from the factories in the rival lake cities of Detroit and Buffalo to stimulate interest.



EXTERIOR OF CENTRAL ARMORY, WHERE CLEVELAND SHOW IS BEING HELD THIS WEEK.

ing in the background, while a committee of the Dealers' Association, consisting of W. L. Colt, C. M. Brockway and H. M. Adams, is co-operating with Mr. Collister in the show management.

The decorative work has been taken entirely off the hands of the exhibitors this year and a uniform scheme prevails for all the stands.

Complete automobiles and chassis are exhibited on the main floor, while the galleries are devoted entirely to parts and sundries. The booths on the main floor are on platforms raised a few inches above the floor; they are not inclosed in any way, but at each corner is an ornamental metal post carrying incandescent electric light globes. On the outside of the globes is the name of the car displayed in the stand beneath. Neat glass signs suspended from chains stretched between the posts on either end of the booth carry the name of the company or the name of the car.

Some of the earliest experimental cars in the history of the American industry were evolved in Ohio, Indiana and Michigan. Among these were the old Elwood Haynes machine, which, completed in 1892, will henceforth repose in the Transportation Section of the Smithsonian Institution in Washington. Other early cars are the first experimental machines of Alexander Winton.

THAT OUTDOOR SHOW.

Something Finally May Come of the Long-Talked-of Plan.

An out-door show in September or October is a possibility, if the plans of the American Motor Car Manufacturers' Association are consummated. At the recent annual meeting held in Chicago the association unanimously voted to hold an out-door exhibition, and to invite the trade at large

to participate. R. B. McMullen, the general manager, was instructed to investigate the matter and report at the earliest possible date. According to the official statement: "The association desires to lengthen the manufacturing season for the manufacturers, and thus gain a reduction in the cost of their product."

The committee of management of the association was increased from five to nine members, and is now composed of the following:

Benj. Briscoe, of Maxwell-Briscoe Company, Tarrytown, N. Y.

James Couzens, of Ford Motor Company, Detroit, Mich.

J. B. Bartholomew, of the Bartholomew Company, Peoria, Ill.

A. C. Newby, of National Motor Vehicle Company, Indianapolis, Ind.

Wm. Mitchell Lewis, of Mitchell Motor Car Company, Racine, Wis.

Chas. E. Duryea, of Duryea Power Company, Reading, Pa.

Chas. Lewis, of Jackson Automobile Company, Jackson, Mich.

Walter Marmon, of Nordyke & Marmon, Indianapolis, Ind.

W. H. VanDervoort, of Moline Automobile Company, Moline, Ill.

The Crawford Automobile Company and the Dorris Motor Car Company are recent additions to the membership.

From Indianapolis comes the following: A meeting of the automobile dealers and manufacturers of Indianapolis will be held within the next few days, at which it will be decided what campaign to follow in the effort to obtain the open-air show. Assurances of support have been received from many dealers outside of the city and state, and local enthusiasts are confident that the show will be held in the Hoosier capital. If it is, it will probably be held at the Indiana State Fair Grounds, north of the city, as there are ample grounds and buildings for the purpose. The Automobile Club of Indiana is beginning to show some interest in the proposed event, and as the membership includes all of the prominent drivers of the state it is thought that its influence will be felt in the effort.

From Detroit this information is just at hand: There is now a plan on foot to hold a national automobile show in Detroit this year immediately following the state fair. It will be held on the State Fair Grounds, where there is plenty of room for the exhibitors and the visitors which such an event would attract. The main building of the fair will be completed so that there will be room enough for everybody. It is said that the Detroit Board of Commerce will be interested in the project.

A bill has been introduced in the Kentucky state Legislature by Member Enloe requiring automobiles to come to a full stop on meeting persons riding or driving horses.

Sixty-one Exhibitors at the Philadelphia Show.

PHILADELPHIA, Feb. 19.—A total of sixty-one exhibitors, displaying forty-five separate makes of automobiles—including about 150 cars—and the thousand-and-one accessories, will provide the Philadelphia public during the seven days from February 24 to March 3 with the most complete display ever set forth in this city.

The huge Export Exposition building, the leasing of which caused quivers of apprehension to mount the spines of some of the more fearful of the Show Committee, has proven much too small to accommodate the applicants for space. Manager Chester I. Campbell, who has had experience in the show line in Boston, had some trouble in inducing the local Automobile Trade Association, which is back of this show, to take such a radical step, but the wisdom of his judgment has been amply attested.

The prevailing color scheme will be red and green, with clusters of flags of all nations and the national emblem, to take away the bare roof effect. An auxiliary electrical plant has been installed, the lighting plant of the building having been found inadequate. Uniformity in the matter of signs has also been provided for, and exhibitors will be on an equal footing in this respect.

Among the foreign cars which will be on exhibition are the Mercedes, Panhard, Simplex, Renault, Mors, and Napier, all being represented by out-of-town exhibitors. Twenty-five local agencies and branches will show thirty-six cars, representing the best efforts of American manufacturers. As to the sundries, the display will be in keeping with the character of the rest of the show—by far the best and most comprehensive ever seen in this city, no less than thirty-one different concerns being represented.

SHOW IN BALTIMORE.

BALTIMORE, MD., Feb. 17.—The Automobile Dealers' Association of Baltimore has been organized and the following officers elected: President, R. Keating, Automobile Outing Company; vice-president, J. J. Mason, Higgins & Mason; secretary, E. L. Buchanan, Callahan, Atkinson & Co.; treasurer, Howard W. Gill, Motor Car Company.

Besides the formation of the association, stock was subscribed to finance an automobile show which it is proposed to hold here from April 2 to 7. B. C. Washington, Jr., assistant secretary of the Washington Automobile Dealers' Association, was the moving spirit of the meeting. He explained the proper method of organization, and laid special emphasis upon the benefits of an automobile show.

The new president appointed a committee consisting of Messrs. Washington, Gill, Bittle, Nusbaum and Slee to look into the matter of a time and place for the show, which will probably take place the first part of April. There are two buildings suitable for such an enterprise—the Lyric, or music

hall, and the Fifth Regiment Armory—the latter is one of the largest structures in the country, and both the Christian Endeavor convention and the Saengerfest of 1903 were held in it.

The amount of stock was fixed at 100 shares of \$10 each, and each concern in the city subscribed. J. Q. H. Smith was appointed to draw up a charter and to attend to all legal matters of the association. Two Washington firms, whose territory includes this city, were admitted to membership in the new association, and it is certain that the Capital City dealers will heartily co-operate with the Baltimoreans in their efforts to arrange the exhibition.

A SHOW IN MONTREAL.

MONTREAL, Feb. 17.—It has been decided to hold an automobile show here from April 21 to 28 in the Montreal Arena. It will be held under the auspices of the local Automobile Club of Canada, of which A. J. Dawes is president. R. M. Jaffray, of Toronto, who will be manager, says that there will be at least 100 cars on exhibition, in addition to a number of power boats and various appliances used in automobiling. A special effort will be made at artistic decoration and there will be various features of interest in addition to the exhibit of the cars.

To get around the trouble of having to pay duty on cars sent expressly from the United States to be exhibited at this show; it has been decided to make an attempt to have the Department of Customs make the Arena a Canadian customs warehouse for the period of the show. The local dealers are giving their support to the event.

1905 FRENCH COMPETITIONS.

The technical commission of the Automobile Club of France has been compelled to elaborate a new word to designate its competition for an apparatus registering mileage and indicating speed. It has been called an "Odotachymetre" competition. The competition, the regulations for which are at present being drawn up by the technical commission, is due to the initiative of Baron Henry de Rothschild, who placed a sum of money at the disposal of the Academy of Sports for this purpose.

The tourist commission is now actively engaged on its 1906 program, and at a meeting yesterday tackled the question of an international information bureau for automobile tourists. On this subject it was decided to enter into communication with all foreign automobile clubs and with all the French sections. The hotel question, now so important when automobiles carry visitors into every corner of the country, is being carefully studied by the commission, and a sum of \$2,000 has been set aside as prize money for a competition having as its object the improvement of French hotels and the rendering of them more fitted

for accommodating autos and automobilists.

An electric vehicle competition will probably be organized by the French club this year, the Association of Automobile Manufacturers having petitioned the club to this effect, and the matter is at present under consideration.

FOREIGN NEWS NOTES.

The Bombay to Mahableshwar reliability trial, over a distance of 500 miles in India, for which the Rajah of Mysore presented a valuable cup, has ended in a draw between a De Dietrich, a Fiat and a Richard-Brasier. Owing to this result, the judges are in a dilemma as to the prize-winner.

A new auto boat, suited principally for torpedo work, has been built by Yarrow & Co. It is 60 feet long and the gasoline tank—the one drawback to the use of such engines for warfare—has been fixed to the hull in such a way that the fuel will flow into the sea if the boat is damaged. The craft is driven by three Napier engines turning three screws. The center engine is of 60 horsepower and the other two of 120 horsepower each.

The automobile concern formed by M. Léon Théry, winner of the 1904 and 1905 Gordon Bennett races, has been registered in London as a limited liability company, with a capital of \$500,000. A similar society with the same amount of capital is also being formed in France. M. Théry will enter the new society as works director, M. Chedru will be technical director, and M. Lejay will be business manager of the two companies.

TO BUILD IN AUSTRALIA.

The firm of Splatt, Wall & Co., of Perth, West Australia, announce that they contemplate going into the manufacture of automobiles in that state of the Australian federation and are desirous of getting into communication with manufacturers of automobile appliances.

Consul Ruffin, of Ascension, sends a report of a Paraguayan automobile line enterprise. An order has been sent to France for the first train of the line, which will be placed in service between the capital and a town twenty miles distant. Although the system is of the automobile type, the operating engines are run by steam, the fuel being coal, wood or crude oil, with a preference for the latter.—*Consular and Trade Report.*

A feature of the automobile show week in Philadelphia will be the gift by the Philadelphia Record of an 18-horsepower, 1906 Rambler surrey, Type 1, to the lucky guesser who shall estimate nearest the total number of coupons clipped from its columns. The Record has made a departure by securing space at the Export Exposition, where the guessing coupon may be deposited and where another Rambler car will be installed.

TENDENCIES IN CAR DETAILS AT SALON.—III.

By RENE M. PETARD.

(Continued from page 345, issue of February 8.)

IGNITION.—Taking first the ignition apparatus, we find as the first and most important point the invariable use of the magneto. No car is made in which there is no provision to adapt a magneto with ease if the owner so desires, this being the case in even the very lowest priced machines, while the great majority of machines in which the very rock-bottom cost price has not been sought after are fitted with magneto ignition as a standard. This has been at the expense of the dynamo, which has never been used in France to any great extent, and is now entirely absent, and of the accumulator, the lack of reliability of which and the charging trouble, deserved this fate.

Unanimous as the trade may have been to adopt magneto ignition as the rule, there are, however, two factions in it which are entirely opposed to each other, and constantly fighting. They are the low-tension make-and-break and the high-tension jump-spark champions. The same endless discussions and controversies which took place in America some years back between the advocates of the primary and the secondary spark, obtained from dry or storage batteries, is revived here between the two types of magnetos. A contribution to the fund of time expended on the subject would be out of place here, and facts alone will be stated concerning what was to be seen at the Salon.

A number of makers using the high-tension system mention that if so desired they can fit a storage battery to work on the same coil and distributors as the magneto, as a spare in case of breakdown or to facilitate starting. This, however, is never considered as necessary by any of them, while very few are those who consider it necessary to fit the two sources of electricity as a standard. These latter often fit two sets of plugs to the engine, one set being used for each source of current, but the majority use only one set, to which, if subsequently necessary, both systems of ignition are connected.

Very few makers of machines fitted with low-tension make-and-break ignition also fit the battery ignition, as it means an entirely different system of wiring and a special plug. Some, however, such as Mors—for which the jump spark is necessary to the working of some kind of self-starting apparatus—use the secondary ignition as a standard in addition to their regular make-and-break. Renault uses the high-tension magneto exclusively, while others, such as De Dietrich, act in perhaps the most mechanically correct manner—they consider carefully the different advantages of both systems, and the requirements of their va-

rious types of machines, and act accordingly. Thus, on town cars, where low power, silence, simplicity, and smoothness are required, De Dietrich employs the high-tension magneto, while, on the contrary, on the touring machines, where the maximum efficiency is wanted out of the high-powered motor, and where a little extra justified complication is not a defect, low-tension make-and-break is preferred by them. A still different course is followed by Delauney-Belleville, who in order to give everybody satisfaction, follow the "commercial-like" course of fitting any ignition the customer may desire, without any expressed preference on their part.

A last point on which the makers hold rather widely different views is on the suitability of a variable spark-timing lever, when magneto ignition is fitted.

It is a phenomenon well known to all having the least experience in dynamos and magnetos, that the intensity of the current increases and the moment of maximum intensity advances as the speed of the armature increases. Basing their conviction upon this fact, a number of makers profess that the timing of the spark does not need to be altered by the driver, and as a consequence the magneto armature and distributors or the rupture cams are rigidly keyed to their respective shafts, and no timing variations are possible.

In some others, on the contrary, the magneto armature, or the cams, or both can be altered in their position at any time during the running of the engine, exactly as in a battery-fired system.

Some others, and among them Renault and Brasier, hold still different views. The time of sparking is normally set at a certain angle of advance and cannot be altered from the seat, while, simply by pushing the starting crank into place, the ignition is retarded to a predetermined extent, permitting the operator to start the engine with absolute safety and without any fear of a back-kick, the apparatus resuming the advanced position as soon as the crank is released.

Lastly, a maker, La Buire, similarly has adopted a fixed time of sparking for normal running, but a suitable interlocking device operated by the change-speed gear lever retards the ignition as soon as the lever is moved, so that the engine is absolutely prevented from racing when changing gears.

Magnetic make-and-break plugs are not to be found in the same number as last year; the public favor not being with them, their success was very slight.

One, however, the Caron, which was described last year on the same occasion,

seems to have enjoyed a growing business, as, although little was heard of it in automobile centers in 1905, the display of the 1906 model was very fine. The plug itself is not changed to any great extent, but the main improvement resides in a special magneto with distributor attached, which does away with one of the main objections to the system, namely, the great consumption in current, exhausting very rapidly the batteries formerly used.

COOLING.—In order to finish with the engine, the cooling systems will now be dealt with, and afterwards the subject of transmissions.

Very few changes are to be found in the cooling arrangements on the 1906 European products. Mention has already been made of air-cooling at the show. As regards water-cooling, both the natural and the forced circulation systems are to be found. The condition as to the respective users of each system has stayed unchanged, each one having apparently obtained satisfaction from what he used. The main point of note is that the pumping design and the general layout of the water systems is, as a rule, much better than it ever was before, resulting in neater appearance and increased efficiency.

Separate watertanks are not to be found anywhere any more, the tank being now always combined with the radiator. The radiator construction, the exact Mercedes type of honeycomb, which was the original system of that class, has practically disappeared on account of too great fragility and liability to get stopped up by internal deposits. Makers and inventors alike are evidently striving to produce a type of radiator that will combine the advantages of the honeycomb as regards efficiency and of the tubular as regards strength. A number of systems of building such radiators was exhibited tending toward that end, and one may well presume that although the tubular still exceeds in numbers, it may in the course of time be upset by a fresh attack from some new and improved form of the fashionable honeycomb.

As regards fans the majority of cars were fitted with one either in the flywheel or right at the back of the radiator. In the latter case the belt drive by flat belt is the favorite system. Its use has led to the designing of a number of clever belt tighteners, some hand adjustable and a greater number automatic through spring action. These devices are highly interesting, but they are so numerous and so different that no general description is possible.

CLUTCHES.—After the study of engines, a study which was unfortunately kept too

brief by the limited space which could be devoted to it, we come to the part of the automobile which shows probably the largest possibilities for improvement. The clutch is the part in the design of automobiles which varies the most, the principles on which its action can be based being almost innumerable, while there has probably not yet been found the exact principle from which it will be possible to work out a clutch answering all the widely differing requirements of an automobile clutch. The most extensively adopted type of clutch, up to the present, is that which the first makers of automobiles, especially Panhard and Levassor, who were its originators, universally used—the leather-faced cone clutch. This type of clutch is too well known to our readers, both in its principle and in its general construction, to make a description of it necessary. We might, however, mention that its two principal advantages are its simplicity and its low cost of construction, while it presents a number of drawbacks which, although they may individually be considered as merely matters of slight importance, nevertheless create when taken as a whole a state of marked inferiority for the leather-faced cone clutch when compared with what our present knowledge allows us to expect within the near future. Among these defects we can find:

(1) Gradual action is only obtained in such clutches by slipping, and this is destructive of the leather.

(2) Proper fan action from the flywheel arms is next to impossible to obtain.

(3) The driven member necessarily has a large amount of inertia, which causes difficulty and noise in the changing of the gears, beside making such changes destructive to the gear-teeth sides.

(4) It necessarily sets up axial strains coming from the clutch spring on the parts; this leads to complications in the design in order to take them up, and generally necessitates the use of expensive ball thrusts and similar parts.

In order to avoid these defects many changes have been proposed, but they almost always lead to a disproportionate increase in complication and initial cost, while they oftener than not increase some of the other evils. At the same time it should be remembered that the greatest point of weakness in the leather-faced cone clutch is its very principle: namely, the use of leather. Leather is not a "mechanical material," and too many designers who use it freely for all sorts of purposes seem to forget that it always was considered by the best European designers as a makeshift to be avoided whenever possible, with the result that most of the best European makers now build cars in which there is not anywhere a particle of leather used in the mechanism.

All the defects in the cone clutch naturally increase with the power to be transmitted, and this is so true that on their 120-horse-power racer the Locomobile people thought safer to use a metal-to-metal cone clutch.

This was a move in the right direction, as it went to the root of the evil, suppressing the leather; but it did not do away with any of the other objections mentioned, and, in fact, still increased the third drawback, bringing in besides, a new factor of disturbance, namely, the old and well-known fondness of metal cone clutches to stick when dry and their ineradicable tendency to slip if lubricated to the least extent above what is just necessary.

Among the improvements which (as was before mentioned) were found necessary to obtain better results we might mention the carrying of the clutch on an extension of crankshaft formed integral with the latter, or bolted on, the longitudinal thrusts being taken up by this extension, also the fitting of springs and plates underneath the latter to give smoothness to the action, these latter devices having the defect of wearing out rapidly and of often causing more or less rapid wear of the leather.

While on this point it might be well to mention that Renault found satisfactory to preserve for 1906 the saw cuts in the female member which he introduced last year to give gradual action. In his construction the



SAW CUT SLOT IN FEMALE MEMBER OF RENAULT CLUTCH.

female cone carries milled slots *S*, as in the drawing, and a saw cut *s*, forming thus a sort of tongue *f*, which by the internal elasticity of the cast metal is caused to open slightly in the direction shown by the small straight arrow. When the driven member is pushed into engagement, the rotation being in a counter clockwise direction, the end of the tongue *f* first comes in contact, and the pressure gradually closes *f* back in its proper position until the full surface of the female member is in driving contact of the male cone.

In order to obtain the same gradual effect Ader uses this year a new, unthought-of principle which, although it appears rather unlikely at first sight, is, nevertheless, said to be borne out in practice. The flywheel is made with a full web, as well as the male member of the direct cone; thus, when the male member is let in to give the drive, the air between the flywheel and the cone is compressed by the forward motion of the latter and acts, or is said to act, as a buffer. The air has to work its way out between the leather lining and the female cone's face. It is claimed by the makers that the arrangement prevents the clutch from taking hold fiercely, the inequalities of the leather taking hold first and the rest of the surface later when all the air has been expelled.

To obtain certainty in the drive, and thus prevent slipping when the clutch is in full contact, and preserve the leather lining, a number of makers are this year using

locking devices on their clutches. A service of this kind was described a little time ago in these columns on the occasion of a description of the Brasier cars for 1906. The device described on that occasion is probably one of the best of its class, as it presents the following characteristics:

The diameter and the angle of the cone are calculated to just take the driving power of the motor in normal conditions; thus, when letting the clutch in, a considerable amount of slipping occurs which gradually decreases as the car picks up speed; when the speed of the machine is sufficiently high as compared to that of the motor the foot pressure on the pedal is completely released, the locks then come into engagement and the drive is rigidly transmitted. Care is shown in the determination of the distance the locks are set from the center of clutch; this distance is such that the strain on these will be a minimum. In order to make this quite clear it will be necessary to state what troubles have so far been experienced with locking devices on clutches. If the locks are placed too close to the center of the clutch the pressure on them is very great, as the radius is too short; this has no ill effect as regards the letting in of them, but when it comes to pulling them out the friction set up by this pressure between the latches and their seat is very great, resulting in a great effort being required by the foot to pull them out, besides overcoming the spring pressure. If, on the contrary, the locks are placed too far out toward the periphery of the cone, their linear speed is very great, and when they come opposite their seat they fall in "with a bang." The difference between their own speed and that of their seat being often very great, it frequently happens that the locks are simply sheared off when they are about to take up the drive.

In order to make up for the lack of gradual action of these clutches without complicating them, springs or other transmission shock absorbers are often fitted. This is the case in particular in the Darracq, C. G. V. and Louet.

No special mention was made in the foregoing of the reversed cone clutch in opposition to the direct type. Both systems have their merits and their drawbacks, and both approximately share the preference of the makers. It should, however, be noted in favor of the direct type, that in the reversed type it is a very difficult job to get at the leather to give the necessary care and to renew it, as it means taking down a number of important parts, while, on the contrary, in the direct type the leather is perfectly accessible.

Before leaving the subject of the cone clutch it should be remarked that the tendency with users of this system is now to mount the male member on a small range universal joint of simple construction in order to allow it to center itself perfectly inside the female part without creating any binding stress on any part of the mechanism.

(To be continued.)

French Progress in Aerial Navigation.

PARIS, Feb. 15.—A startling novelty in aero navigation is the flying apparatus which Adolphe Vuia, a French engineer, has recently brought forth with the idea of selling the patent to the War Ministry.

The machine consists of a light quadricycle frame set on four wheels, with steering post and basket seat. On the top of it stands a conical structure of aluminum tubing, some two feet high, supporting long, wide, incurved wings, bat-like, absolutely rigid and covered with air-tight and water-proof French silk.

A carbonic acid motor (which generator is placed behind the driver's seat) is fixed on the top of the conical frame and acts on a front propeller, also made of aluminum tubing and covered with silk. On the rear of the engine works the rudder.

The only object of the rigid wings is "hovering"; that is to say, lightening the wheeled machine when sailing on earth and enabling it to travel lightly over harvested fields, ploughed soils, cross ditches or streams, and lifting it altogether when a certain speed is reached.

Vuia says he can carry a small caliber repeating gun of 300 to 400 pounds and fly with it when necessary. Successful experiences were made by the inventor these last few weeks on the plains of Montesson, near Paris.

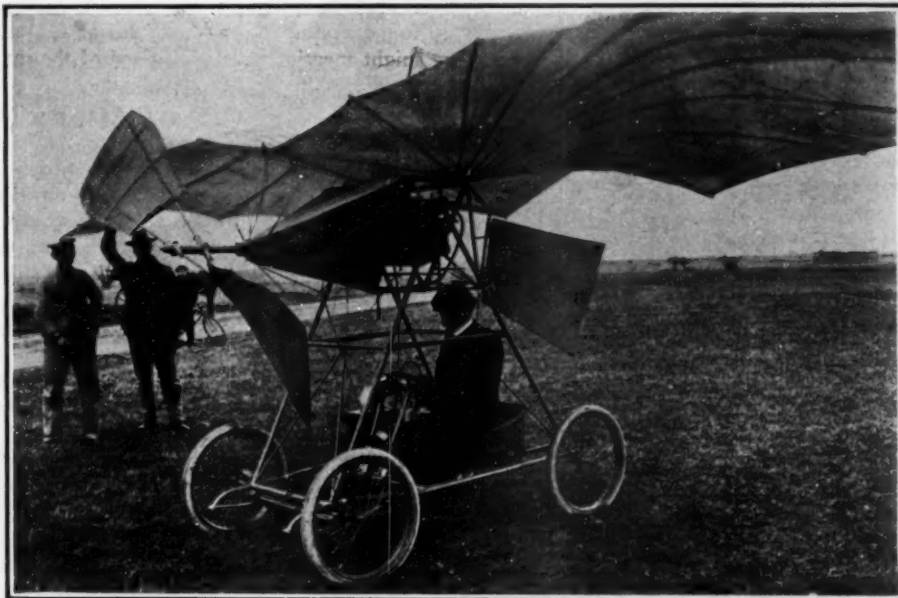
In the future wars we may see the light fifty-shot Maxim or Hotchkiss gun swiftly taken from one position to another by a strange engine that glides noiselessly over valleys and streams, bounds over hills and mountains, and, suddenly, from behind an abrupt rock, fire a rain of bullets on the enemy's patrols.

When the great Napoleon saw in Versailles the first long-range breech gun, invented by Captain Perrier, of the First Artillery, he made a comment which Jules Verne has cited in his famous book "Robur, the Conqueror":

"In a near future, Messieurs, balloons will be used to carry these heavy guns in the air. Science and Death always walk together. Let us comply with the whims of God."

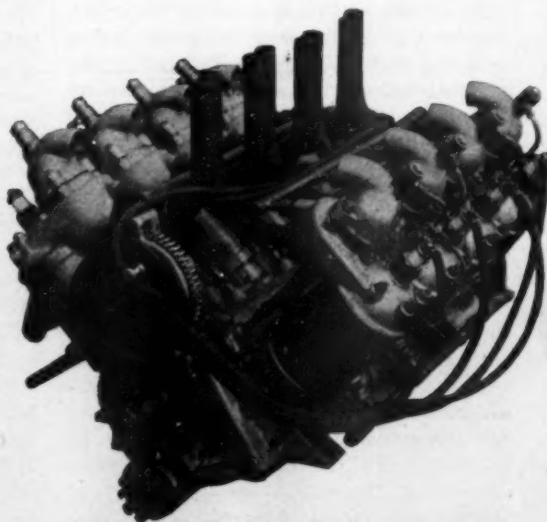
Santos-Dumont's New Helicopter.

Santos Dumont, uncontested king of the air, had abandoned forever the inflated balloon long before the success of the Wright brothers in air hovering was heard of in Europe. He said lately at a private dinner of the Aero Club of France, in Paris:



ADOLPHE VUIA'S FLYING MACHINE PROPELLED BY CARBONIC ACID MOTOR.

"I don't care what the mysterious brothers Wright have done or will do; I have been patiently studying the fascinating question of bird flying for nearly two years, and since that time my frequent ascensions in



EIGHT-CYLINDER MOTOR OF SANTOS-DUMONT'S HELICOPTERE.

cigar-shaped airships were somewhat of a little bluff. . . . It took me ten months to obtain a 30-horsepower motor weighing only a hundred pounds complete. I am well fixed to-day, and am certain I will realize Jules Verne's dreams sooner or later."

It is in Neuilly St. James, near the gates of Paris, that Santos, inside a corrugated zinc shed, is discreetly building the new flyer. Here and there lay big, long incurved wings, bat-like, covered with air-tight and water-proof French silk, the aluminum frames of the propellers (two opposed acute angles of light tubing), and the famous engine that a very few friends of the aeronaut were permitted to inspect up to now.

This engine is an eight-cylinder, built by Levavasseur, of Puteaux; a "V" motor, as they call it in France, with cylinders cast at 45 degrees. The exhaust valves are placed on the top of the breeches, and the exhaust piping stands vertically, so as to insure the perfect balance of the machine when in motion. The lower part of the crankcase bears small lateral banks, cast with the piece, in order to retain oil fore and aft when sudden starts in any direction are demanded. A high-tension magneto,

combined with a secondary current distributor, insures reliable ignition.

The bore of the cylinder is 75 millimeters, and the stroke 90. The motor gives as much as 32 horsepower at the brake test, but is called only a "24," which is the power it develops at a normal revolution of 900 to 1,200 turns a minute.

The weight of the engine, with a 45-millimeter flywheel, is a little less than 120 pounds.

Santos Dumont expects to take his helicopter out of its shed by the end of March.

Gossip of Cloudland.

Dr. Julian P. Thomas, of New York city, a member of the Aero Club of America, has ordered a balloon from Charles Levee, whose successful ascension at West Point recently was witnessed by Doctor Thomas.

The Aero Club of America will be represented in the first competition for the Bennett Cup, offered by James Gordon Bennett to promote the science of aerial navigation. M. Santos Dumont and Frank Lahm are designated as the representatives of America. Dirigible airships, but not aeroplanes, may sail for the cup. Cortlandt Field Bishop, the foreign representative of the American club, will sail for France early in April.



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**Attention
to Details
on 1906 Cars.**

With the American manufacturers practically a unit in the matter of automobile design, it is gratifying to note that this year marks a greater care and closer attention to the fitting of the small essential attachments and devices which have hitherto been absent from the cars of moderate cost. In order to obtain anything like a full complement of the convenient and necessary fittings, a purchaser has been compelled either to select a foreign or an American machine of high cost or have a number of attachments fitted to his small car at the expense of considerable time and the expenditure of a tidy sum.

The American maker is directing his attention to the matter of essential and convenient fittings and, while not so ardent an admirer of the ostentatious display of brass-mounted dash attachments as the Continental manufacturer, the tendency is strongly marked toward a careful provision of such devices as will contribute to the efficiency of the car and ease of up-keep. Heretofore there has been a strong desire on the part of our manufacturers to produce a machine that will appear simple; but "apparent" simplicity is not necessarily advantageous, as any owner of a car of moderate cost can testify, and the addition of any number of necessary attachments is justified when the resultant mechanisms

contribute to the efficiency of the car as a whole and materially aid the owner or driver in keeping the various vital parts in the best possible working order.

In some cases the American idea of suppression of the extensive battery of dash fittings seen on Continental cars results in a decided advantage. An instance that may be mentioned is the practice of placing the mechanical force-feed oiler under the hood where the piping is short and the uniform temperature induced by proximity of the oil tank to the motor contributes not a little to efficient lubrication. But this desire for apparent simplicity can find no justification in omitting grease cups or oil cups from such important bearings as the steering knuckles and linkage connecting the front wheels, which until this year, in by far the majority of American cars of moderate cost, were perforce lubricated by pouring oil over the outside of the parts.

In a number of the 1906 models of moderate and even low cost a marked effort has been made by the manufacturers to provide a direct and reliable means of lubricating the moving parts of the chassis which have no connection with the power plant and transmission. The use of small oil and grease cups on the steering connections and on the linkage shackling the springs to the side members of the frame is to be highly commended and must result in added life and increased efficiency of the car.

A more careful designing of these small but vital parts of the automobile has contributed not a little to the ease with which regular and systematic inspection and lubrication may be carried out throughout a season.

Although not usually considered in the light of attachments, the greater care that has been given the construction of brakes will add materially to the efficiency of the moderate-priced car. A number of makers have added a positive braking system to safeguard the car from running backward down bad grades, and the ratchet sprag is found on several machines this year.

To anyone who has driven a car of moderate power through a country abounding in excessive grades the importance of a device of this kind will be at once apparent. A sprag of whatsoever type may not be called into action throughout a driving season, but when it is wanted it is wanted bad; moreover, a car so fitted is much easier to start on a bad grade. When the character of the country and the tendency of the American maker towards providing necessary attachments are considered, it is safe to predict that next year will see a vastly increased number of cars fitted with a sprag capable of being instantaneously put into engagement.

The educational results from the series of shows unquestionably are substantial. How much longer the exhibition will give compensating returns is a question the makers will soon be called upon to consider.

**Dangerous
Animals on
the Streets.**

Reference to reliable records shows that the automobile is in reality responsible for a very small proportion of the fatalities and accidents occurring in our largest cities. In New York, where there are doubtless in the neighborhood of 10,000 automobiles in regular use, the records in the coroner's office show that, of the 235 persons who lost their lives by being run over in the streets during 1905, only eighteen were killed by automobiles and automobile trucks, and of these eighteen one died from the effect of falling off of an automobile.

In Chicago the showing is far more favorable, the report for last year showing that only five persons were killed by automobiles, while 337 were run over by street cars alone—and the number of automobiles in operation there is given as 3,600, while there are but 2,100 street cars. The report of the Chicago coroner for last October shows that, out of the 233 persons who died by violence or from accidents there in that month, only one was killed by an automobile.

In the full-page special illustrated article printed in the New York *Herald* of recent date, the ratio of deaths occurring in the entire state of New York for one year by different methods of transportation was given as follows:

Horses, 40 per cent.;
Steam railroads, 30 per cent.;
Electric railroads, 15 per cent.;
Boats (all classes), 10 per cent.;
Automobiles, 5 per cent.

Although it may be assumed that the figures as given are as nearly right as any statistics that are available, there is every reason for believing that the proportion is unduly high for automobiles, since, as the *Herald* states, "It is difficult to obtain reliable data of runaways. About one in three is reported in the public press and about the same proportion in the police courts." An automobile accident, on the contrary, rarely goes unrecorded.

When the figures are collected for the whole country the number of persons killed and injured by horses is appalling; police court records for eleven months ending with November last, collected from forty-nine states and territories in the United States, show a total of 46,356 recorded runaways, 4,279 deaths and 15,105 injuries.

Considering the foregoing figures, we are bound to look upon the horse in a new light; he may be the "friend of man," but at best he is an unreliable and often dangerous one. No one can tell when a horse, no matter what his age, length of servitude and staidness of habit, will take fright at a fluttering bit of paper or some equally harmless thing and run away.

"Every state in the Union, and the federal government as well," says the *Herald*, "has enacted laws looking to the public safety in travel by steam and electric railways, by waterways and by automobile, but the horse has been permitted to continue his mad

career, running amuck at the slightest provocation, through the most crowded thoroughfares of otherwise the best governed municipalities in the country."

Looking into the future, the progressive man foresees the time when horses will be rigidly excluded from the streets of our largest cities. This is a mechanical age, and muscular power is steadily giving way in all lines of the world's work. As soon as the time arrives when the small grocer and meat dealer can afford to own automobile delivery wagons and the wholesaler can have powerful trucks the great public will have become fully accustomed to automobiles, and, recognizing their many advantages, will begin to ask itself why it tolerates the use of animals that may at any time become unmanageable. Hygienic and esthetic considerations will also have greater weight then, and common humanity will take pity on the one remaining animal that is condemned by civilization to arduous slavery. As a result of the awakening, laws will be passed prohibiting the driving of horses within the limits of our great cities. If necessary, depots can be established on the outskirts, at which the produce from truck farms can be transferred to automobile trucks for haulage to the city's center.

Such a law would doubtless work a hardship on the poorer classes of horse users—all laws aiming at the greatest good to the greatest number affect some persons more or less injuriously, just as the laws regulating the area of light and air shafts in tenement houses increase the renting prices of apartments. The resulting good, however, more than offsets this.

What delightfully well-paved, clean and quiet streets we shall have in the years to come, when we have outdistanced the plodding and dangerous horse!

LONG ISLANDERS WANT CUP RACE.

Down on Long Island there is apprehension that the Vanderbilt cup race this year may take place in New Jersey. Mineola is the county seat of Nassau county, and a newspaper correspondent writes as follows to the *Brooklyn Eagle*:

"The race last year left a big lot of money in this section and those who benefited by it were numerous. The question of utilizing the public roads is not considered as an impossible barrier to the holding of the coming race, and it is believed that if it was known the supervisors should contemplate denying the privilege accorded for two years past, there would be petitions from residents requesting the officials to grant the Automobile Association of America the roads as heretofore. Sentiment in regard to the race being held in Nassau county this year is stronger than ever among people hereabouts, and it will be a big disappointment if the event goes to New Jersey."

The kaiser's automobile is said to be the only machine in Prussia which is not taxed.

The Classification of Racing Cars.

Cylinder Displacement Plan Meets with A. C. A. Committee Approval and Is Referred to A. A. A. Board.

Criticism of weight classification in automobile racing has been heard for some time, and out of it has grown a cylinder displacement plan that may be adopted, at least for many important competitions, even if it is not wholly adopted. Well-known students of racing have suggested the cylinder displacement idea, H. H. Franklin and S. D. Waldon included, and recently the first named has been particularly active in the matter.

Monday at the Automobile Club of America representatives of the racing and technical committees of that organization met, and the following resolution tells its own story:

"That the suggestions made by Mr. Franklin in his letter to the president of the club be referred to the Racing Committee of the American Automobile Association, through Mr. E. R. Thomas, who is a member of that committee, and also of the Racing Committee of the Automobile Club of America, with the request that the same receive careful consideration, and further

"Resolved, That the suggestions of Mr. Franklin be referred to the Board of Governors of the Automobile Club of America, with the idea of incorporating some of them into the rules for some of the coming endurance and other tests."

George Isham Scott, who is chairman of the Racing Committee, presided at the meeting, and the others present were E. R. Thomas, James L. Breese, Dr. Schuyler Skatts Wheeler and President Dave H. Morris.

It had been expected that Mr. Franklin would be present to explain his methods, but John Wilkinson, who has given the subject a great deal of careful attention, appeared as a substitute and explained the practical working of the cylinder-displacement plan.

"This principle," explained Mr. Wilkinson,

"means that all cars would be geared to displace a certain number of cubic inches per mile on the high gear of the car. This displacement is the number of revolutions per mile multiplied by the area of the pistons and by the stroke of the pistons, and then by two, there being two explosions per revolution. This does not determine the area of the pistons nor the number of revolutions per mile, but simply stipulates what the displacement will be. Being limited to a certain displacement, the manufacturer can make his other proportions as he sees fit. This will give the greatest scope to mechanical construction, and the different methods adopted to produce the most satisfactory results with a standard displacement basis will be of inestimable value for the future growth of the automobile industry, while allowing critics of various machines to determine what cars are best suited for their special needs."

"Owners of automobiles," added Mr. Wilkinson, "are anxious to know what is the best form of motor. Manufacturers are trying to solve the problem, but it is natural that in big races where excessive speed is the necessity, cars of abnormal motive power will be made. Mr. Franklin's plan advocates a displacement basis that will encourage rational sized motors, those most likely to be used in the ordinary touring cars. With a number of manufacturers working on this plan and with the assurance that their improvements will meet with careful consideration, it is almost safe to say that within a very short time American cars will attain a high standard of efficiency and comparatively light touring cars will be enabled to make just as fast time as has been done by many of the Vanderbilt racing machines, and yet with motors at least one-third the size."



R. S. MUNGER, OF BIRMINGHAM, ALA., AND HIS PARTY OF AMERICAN VISITORS TO CUBA.

The Busy Lawmakers.

ALBANY, Feb. 20.—Senator L'Hommedieu has amended his automobile tax bill to make the tax on weight instead of horsepower, and as amended hopes to get the bill reported this week. The bill, if it becomes a law, will tax each power vehicle in the state fifty cents; in addition, a tax of fifty cents for each 500 pounds over a weight of 500 pounds is to be assessed. This is expected to raise about \$80,000 in the state in one year, which, by the terms of the bill, is to be expended only on the repair and maintenance of improved highways. The original bill permitted the fund to be used in the construction of good roads as well as their repair, whereas the amended bill confines it to repairs and maintenance. The weight of a vehicle includes the weight of the top, the tires, the lamps and all the ordinary equipment of a car.

Assemblyman Robert J. Cox, of Erie, has introduced at Albany an amendment to the present New York state law. It provides that when an automobilist has been arrested for violation of the law he may give security for his appearance in the form of a bond issued by a surety company. The present law provides that he may either give cash bail or leave his vehicle as security. The bill is favored by the Automobile Club of Buffalo.

The Stanley Automobile Bill, recently introduced in the New York state Legislature, does not bear the indorsement of the Automobile Club of America. The Law Committee of that organization did have a conference with the West Side Association of New York City, but subsequently the club's board of governors placed itself on record as opposed to the measure, which terminated the interest of the A. C. A. in the matter. The bill was subjected to considerable alteration, and then introduced by Assemblyman Stanley for the West Side Association. The New York State Automobile Association will vigorously oppose the bill at the first public hearing.

Delegations of automobilists from New York and Philadelphia, and from all over New Jersey, were at Trenton on Tuesday, when the Frelinghuysen Bill was up for a public hearing by the judiciary committee of the New Jersey Senate. If the substantial protest which the automobilists made to the proposed law is not effective, a substitute measure will be introduced which will be drawn in accordance with the ideas of Governor Stokes.

Welcome news from the West is to the effect that freight rates on automobile parts have been reduced 50 per cent. west of the Mississippi River, and hereafter goods coming under this classification will be shipped at the rate of \$3 per hundred pounds instead of the \$6 rate which has heretofore prevailed.

MARYLAND CLUB INCORPORATED.

At a meeting of the Automobile Club of Maryland, held recently in Baltimore, the organization was incorporated under the laws of Maryland. The five incorporators were: M. Gillet Gill, C. Warner Stork, former secretary, H. M. Rowe, Richard J. Leupold, vice-president, and J. S. Detrick. A board of directors, consisting of the foregoing members and W. S. Belding, president, Ernest J. Knabe, Jr., treasurer, and George S. Dickey, secretary, was formed. It was decided that an Orphans' Day outing and parade should be held the latter part of May or the first of June, and a committee—which was not named, owing to the absence of the president—was appointed to look after the matter.

BATTLE CREEK-BELLEVUE ROAD.

At a meeting of the Good Roads Committee of the Business Men's Association of Battle Creek, Mich., it was decided to go ahead with the work of improving the highways leading into that city. The first experiment will be the building of a road between Battle Creek and Bellevue. A committee of farmers present pledged 500 days' team work. A letter was received from State Highway Commissioner Earle indorsing the project and informing them that he will hold a county road institute at Battle Creek March 13.

The custom of fitting a multiplicity of devices on the dash of an automobile is on the wane, a number of the largest and most representative cars for the current year showing the desire on the part of the manufacturer to keep the dashboard assembly as simple and plain in appearance as is consistent with the proper management of the various functions of the mechanism.

A car that coughs may not be very consumptive—of gasoline.—*Exchange*.

The "Speed King" Sails.

Victor Demogeot, the "Speed King," sailed from New York Tuesday on the Kaiser William II. It is probable he will be the Darracq representative for the Vanderbilt cup race.

A Baltimore machinist named George S. Schwabek has been making some successful experiments this winter with a flying machine, which he calls an "aerautomobile," at North Beach, Long Island. The machine with which he made a flight on January 26 is built of aluminum and wood. From the frame rise two uprights carrying large horizontal propellers that give the lifting force. At the ends of the main framework are two driving propellers and two smaller steering wheels with fan blades. This machine was operated by manual power, but it is the inventor's intention to build a new machine entirely of aluminum and to fit it with a gasoline motor.

Officials of English railways are deploring the fact that because of the increased use of the automobile for long-distance travel, revenue from first-class passengers has fallen off to an alarming extent. During the last half of the year 1905 the Great Eastern Railway carried 37,235 fewer first-class passengers than in the previous corresponding period.

He had led her out to look at his new car, with its magnificent bay windowed body. He was one who had seen some grievous experiences through reckless driving on the road, too. "Isn't that a stunner?" he exclaimed.

"Oh, I think it is just perfectly killing," she cried, gushingly.

"Huh?" said he.—*Exchange*.

Fire Chief Cheswell, of Boston, Mass., has been provided with an automobile equipped with fire extinguishers and other fire-fighting appliances.



CHAS. F. TAMMANY AND PARTY ON THE GREAT HIGHWAY, SHOWING CLIFF HOUSE, SUTRO HEIGHTS AND SEAL ROCKS, SAN FRANCISCO.

Letter Box

That Tax on Denatured Alcohol.

Editor THE AUTOMOBILE:

[318.]—The Committee on Ways and Means, February 7, at Washington, gave a hearing on the subject of untaxed denatured alcohol. Little in relation to this important subject was published in the daily papers.

As witnesses at these hearings a large number of representatives of the agricultural and manufacturing interests of the country were in attendance. Among the organizations represented were the New England Society of Chemical Industry, the National Grange of the Patrons of Husbandry (representing about 800,000 farmers), the Fur Hat Manufacturers' Association of the United States, the National Association of Piano Manufacturers of America, the Detroit Chamber of Commerce, the Trades' League of Philadelphia (with a membership of about 3,000 manufacturers and business men), the Chair and Furniture Manufacturers' Association of Gardner, Mass., the American Chemical Society, the National Painters, Decorators, and Paper Hangers' Union (with a membership of 80,000), and representatives of such prominent manufacturing concerns as the General Electric Company, the International Harvester Company, Otto Gas Engine Company, Welsbach Mantle Company, and numerous other manufacturing concerns.

The hearings were attended by a large number of representatives in Congress, who listened attentively to the testimony of such men as ex-Governor Bachelder of New

Hampshire, representing the National Grange; M. N. Kline of Philadelphia, president of the Trades' League; Professor Charles E. Monroe, of the Washington University; Dr. H. W. Wiley, of the United States Department of Agriculture; Charles E. Keator, of Dunlap & Company, and L. B. Goebel, of the Otto Gas Engine Company, who all testified as to the great importance to our agricultural and manufacturing industries of the removal of the internal revenue tax from domestic alcohol made unfit for beverage purposes.

Special interest at these hearings was created by the testimony of C. L. Bedell, a painter of Lynn, Mass., who was recently rendered totally blind by the fumes of wood alcohol which he was using to clean the floor of a small, unventilated room.

It would seem that public hearings of this kind, before the full Committee on Ways and Means, relating to a matter of widespread interest to the manufacturers, farmers and business interests of the country generally would be entitled to at least a brief report in the columns of our daily newspapers. Yet, with few exceptions, the subject was altogether ignored.

As former president of the American Automobile Association, I took occasion in a recent address before that association to point out the danger to the motor vehicle and power boat industry of the increasing cost of gasoline, due to the steadily decreasing supply proportionate to the demand. At that time I pointed out that the only satisfactory substitute for gasoline that had yet been found was ethyl or grain alcohol which, with the tax removed, could be produced in practically unlimited quantities.

As was testified before the Committee on

Ways and Means, in a paper by Professor Elihu Thomson, the eminent scientist and inventor, read by Representative Roberts, of Lynn, Mass., alcohol is an entirely satisfactory motor fuel for internal combustion engines, and the removal of the tax from alcohol made unfit for internal use would permit the substitution of that material for gasoline for the internal combustion engines which are coming into use everywhere on American farms.

Whether alcohol can be satisfactorily used in automobiles is still a matter of argument, but there is no question but that, with the tax removed, denatured alcohol would be substituted for gasoline for burning, lighting, cooking and similar purposes, as well as for motor fuel for farm engines. This would, of course, serve to relieve the growing demand for gasoline, and thus directly benefit the motor vehicle industry, which is rapidly becoming one of great importance to the country. WINTHROP E. SCARRITT.

New York City.

Troubled by Motor Stopping.

Editor THE AUTOMOBILE:

[319.]—When my car is at rest, with the motor, which has four cylinders, running as slow as possible—about 250 revolutions per minute—on pulling the throttle open any additional amount the motor will slow down before speeding up. If the throttle is pulled open quickly the motor will stop and require to be restarted by cranking. The carbureter is the so-called automatic type, with separate air valve held shut by a light spring.

What is the cause and remedy for this malady? AMATEUR.

Detroit.

AUTOMOBILE COMPANIES RECENTLY INCORPORATED.

Western Launch and Motor Company, New York; capital, \$100,000; manufacture and equip ships, boats, etc. Incorporators: J. G. Daniel, G. W. Roberts, C. A. Greene.

George J. Scott Motor Company, New York; capital, \$25,000. Directors: G. J. Scott, M. Scott, Jacob Michaels.

Union Automobile Company, St. Louis, Mo.; capital stock increased from \$15,000 to \$35,000.

The Automobile Company of Paterson, Paterson, N. J.; capital, \$15,000. Incorporators: A. B. Watson, S. J. Watson and E. M. Squires.

Excelsior Automobile Supply Company, Chicago; capital, \$10,000. Incorporators: Harrison Musgrave, James B. Gascoigne, John A. McKeever.

American Anti-Puncture Tire and Automobile Company, New York; capital, \$50,000. Directors: O. L. Ellison, Dr. C. A. Hegeman and E. L. Barney.

Montclair Auto Station Company, Montclair, N. J.; capital, \$50,000; manufacture motors, engines, machinery, etc. Incorporators: J. W. Surbrug, W. H. Benjamin, Roy Jenkins.

Morristown Garage Company, Morristown, N. J.; capital, \$50,000. Incorporators: Thomas B. Reid, John A. Wise and Alexander Reid.

Walter Auto Car Company, Trenton, N. J.; to manufacture automobiles; capital, \$1,000,000. Incorporators: A. R. Kuser, William Walter, R. V. Lindabury, John L. Kuser, R. V. Kuser, Fred Kuser, C. E. Murray, F. W. Roebing, W. A. Roebing, 2d, A. C. Reeves, M. R. Margerum, Eiseley & King, Herman Unger and C. W. Stengle.

Mack Brothers Manufacturing Company, Brooklyn, N. Y.; to manufacture motors and machinery; capital, \$300,000. Directors: Otto Mears, O. F. and W. C. Mack.

James Macnaughton Company, Buffalo, N. Y.; to manufacture motors; capital, \$100,000. Directors: James Macnaughton, C. S. Chamberlain and M. D. Ashford.

Arc Spark Manufacturing Company, New York; to make automobile sparking plugs; capital, \$10,000. Directors: K. C. Wideen, C. J. Pearson and F. T. H. Bacon.

New Century Auto Company, New York; capital, \$1,000. Incorporators: W. B. Franke, David Lamb, F. L. Kelley, Jr.

The Auto Shop Company, Cleveland, O.; capital, \$50,000. Incorporators: C. F. Schroeder, I. B. Sperry, W. C. Schroeder, M. W. Lusk and A. L. Maurer.

Ducro Manufacturing Company, Buffalo, N. Y.; to manufacture motors, boats, machinery, etc.; capital, \$5,000. Incorporators: L. C. Ducro, Charles Jempson and E. S. Ducro.

Stenhart-Jensen Automobile Company, Joliet, Ill.; dealing in and renting automobiles. Incorporators: E. W. Stenhart, C. F. Jensen, W. H. Whitmore.

Coltman Wheel Company, Chicago, Ill.; capital, \$15,000; manufacturing automobile parts and appliances. Incorporators: A. A. Worseley, N. H. Henchette, J. H. Whitfield.

Plaza Automobile Company, Brooklyn, N. Y.; capital, \$10,000. Directors: H. B. Sands, Abraham Adelberg, M. H. Sands.

Corning Automobile Company, Corning, N. Y.; manufacture automobiles, etc.; capital, \$5,000. Incorporators: G. T. and S. K. Wolcott, W. W. Cowan.

The Trans-River Auto Company, Brooklyn, N. Y.; capital, \$15,000. Incorporators: A. T. Herd, R. Ferguson, C. W. Baker.

Club Banquets and Elections.

SYRACUSE, N. Y., Feb. 17.—The fourth annual banquet of the Automobile Club of Syracuse was held in the Yates Hotel, this city, on Tuesday evening of this week. There were 100 guests present, and it was the most successful affair of its kind yet given by the organization. The guests of honor included Charles T. Terry, a professor in the Columbia Law School of New York and the attorney for the New York State Automobile Association.

To Mr. Terry had been assigned the subject of "The Farmer and the Automobile." He yielded to none in his admiration for the intelligent and progressive farmer, but declared there were some tillers of the soil whose conservatism, to use no harsher term, was the source of great vexation to automobilists.

The keynote of Mr. Terry's address, however, was found in his suggestion to have an automobilists' clearing house for complaints. Let the clubs take upon themselves the burden of seeing that the automobile laws are obeyed, punishing or expelling members who fail to comply, and the devotees of the speed wagons can go to Albany strongly armed and can get what they want and should have. The speaker declared the automobilists have it in their own hands to cure the evils arising from freak legislation.

Mayor Alan C. Fobes, in his remarks, spoke of the manufactory of the Franklin concern, which is the largest single concern in the city, employing 1,400 mechanics. The mayor also promised the speedy improvement of Syracuse streets, which assurance the suffering motorists present hailed with exceeding joy.

Camden A. C. Organized.

One immediate effect of the introduction of the repressive Frelinghuysen Bill, now before the New Jersey Legislature, was the organization, on Tuesday last, "for offensive and defensive purposes," of the Camden Automobile Club. Thirty members signed the roll. Philadelphians will be accepted as associate members, and a committee was appointed to go to Trenton to protest against the passage of the measure. The officers of the club are: President, Samuel W. Sparks; vice-president, George E. Rhedemyer; secretary, Hiram G. Hallinger; treasurer, John T. Dorrance.

Jersey Club Banquet.

The third annual banquet of the New Jersey Automobile and Motor Club was held on Thursday night, February 15, in the Continental Hotel, Newark, N. J. There were 125 members present. The hall was decorated with American flags. A Scandinavian orchestra dressed in native costumes furnished the music, and the diners sang after each course, the musical program be-

ing concluded with an automobile galop composed especially for the occasion. The speeches were severe attacks on the Frelinghuysen automobile bill, which is a subject of much discussion among automobilists. The principal speaker of the evening was Winthrop E. Scarritt, of the Automobile Club of America, who finished his address with the declaration that the Frelinghuysen bill was the most oppressive and tyrannical piece of automobile legislation ever introduced into any law body. Other speakers of the evening were R. C. Jenkinson and Angus Sinclair, of the club.

A. C. of Maryland Headquarters.

At a recent meeting of the Automobile Club of Maryland a committee was appointed to look for suitable headquarters. It was the intention of the club to have rooms in the new building of the Mar-Del Mobile Company, but, owing to the desire of some of the members to have headquarters in the other new garage, that of the Motor Car Company, it was decided that the safest course was to steer between the two. A country home has been suggested, but it has not met with general approbation. The committee is composed of Messrs. H. M. Rowe, J. Henry Miller and M. Gillett Gill.

Pittsburg Club Election.

The Automobile Club of Pittsburg held its annual meeting February 19 and elected these officers: President, George E. Turner; first vice-president, W. Linford Smith; second vice-president, W. W. Darley; third vice-president, C. M. Miller; treasurer, George C. Glass; secretary, Paul C. Wolff; members of the board of governors, to serve three years, E. J. Kent, Edward Kneeland, and C. C. Matheson. The club proposes to confine its efforts this year mainly to securing and enforcing desirable legislation, both state and municipal. An initial step in this direction was the forming of the Pennsylvania Motor Club Federation, in which the local automobilists, acting through the club, had a very prominent part. As a result of the Pittsburg club's initiative, many clubs have been formed in Pennsylvania cities where formerly no organized bodies of automobilists existed.

March Meeting of Philadelphia Club.

With a membership closely approaching the 300 mark, the officials of the Automobile Club of Philadelphia are preparing to unfold a scheme at the annual meeting on March 12 whereby the half-thousand mark will be reached by the spring of 1907. Much interest is being manifested in the approaching meeting, not alone because of the annual election of officers, but on account of the announcement that the occasion will be taken advantage of to launch a State Automobile Association. To that end Secretary

H. Bartol Brazier has sent out notices for a preliminary meeting during the automobile dealers' show in the National Export Exposition Building. This meeting all automobilists throughout the state, whether members of any club or not, are urged to attend, as the object of such an organization will be the safeguarding of the rights of all automobile owners in Pennsylvania, regardless of club affiliations.

Buffalo Motor Boat Clubhouse.

BUFFALO, Feb. 17.—The site committee of the Motor Boat Club of Buffalo has selected the Island Clubhouse on Grand Island, on the west channel of Niagara river, for the club home. The house is a three-story structure with spacious verandas and sleeping accommodations for about 100 members and their families. There is a river frontage of 1,200 feet. The house will be refurnished and slightly remodeled for the use of the Motor Boat Club. It is the intention of the club to survey a five-mile racing course, so arranged that a full view of the entire course may be had from the verandas.

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MINNEAPOLIS.—The Minneapolis automobilists who went to Florida to see the automobile tournament at Daytona, are forming a new club, to be known as the Minneapolis-Florida East Coast Automobile Club. Its function will be purely social. Those who made the trip formed many pleasant acquaintances, and it was through a desire to perpetuate these that the organization is being effected.

• • •

At a meeting of the Board of Directors of the Chicago Automobile Club on February 15 Secretary Gorham announced that Mrs. Hetty Green had decided to refuse a long-time lease on the property now occupied by the club. The reason was not stated. Three sites are at present under consideration by the club for its new building.

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A meeting of the Chicago Motorcycle Club was held at the Hotel Bertrand on Thursday night, February 15, and several matters of interest were discussed. It was decided to hold a race meet later in the year, either at Garfield Park or the Harlem race track. The annual race between Chicago and New York will be held, and the date will be announced later.

According to the automobile instructor of a Pittsburg motor school, women make the most apt pupils, for, says he, "they do not anticipate danger, and when an accident occurs they can smile sweetly and get out of it, where a man would land in jail for the same thing."

The usual conservative attitude of the British automobile press has been justified in the case of the performances of the Alfred G. Vanderbilt racing car.

Road Directions at Troy, New York.

BY ROBERT BRUCE.

TROY, N. Y., like its sister city, Albany, is an important center for through routes, leading practically in all directions. Of these two cities—separated by a distance of only six miles—Albany is naturally the principal center for routes to and from New York and the south generally, while the same may be said for Troy in respect to routes to and from the north. Both have close connections of their own east and west, as will appear from the arrows on the Albany map, already published in this series, and the Troy diagram given herewith.

Naturally the most-used route for automobile travel through Troy is that which forms the first part of the main route from Albany to Saratoga, Lake George and north. There is, however, quite a little travel to and from points north, which uses the Citizens' Line of passenger and freight steamers from New York, landing at the foot of Ferry street, Troy. In either case the principal up-bound route can be conveniently figured from the Congress street bridge, across the Hudson River from Watervliet into Troy. The map is drawn on a scale to show the best way to go through the city from the exit of this bridge, briefly as follows:

Follow trolley one block on Congress street to First street, passing Troy Club on the right. Turn left one block on First street to State street (asphalt) and four blocks on State street to Fifth avenue. Left into Fifth avenue (asphalt) and keep same straight ahead about ten blocks down slight grade to right, on Rensselaer street one block, then sharp left into Sixth avenue. Continue straight ahead (running into Fifth avenue, upper Troy), thence up Fifth avenue to Twenty-fourth street. Turn left three blocks to Second avenue (trolley) then one block to right to Waterford bridge. As an alternative, turn left from Fifth avenue to First street (upper Troy) and right into Second avenue (fine brick) to bridge, as before. After going over this bridge and crossing the Delaware & Hudson Railroad tracks, the tourist will cross the street on which the trolleys run, which take by right turn straight to Mechanicville.

Bound to points north and east, whether in nearby New York state, in southern Vermont or northwestern Massachusetts, leave Congress street bridge, or the boat-line dock, by the route already given from the center of the city into Fifth avenue, upper Troy. But instead of continuing north on this avenue (through Lansingburg to Waterford, etc.) turn right on Hoosick street, keeping with trolley to Fifteenth street. Here leave trolley (which turns to right), continuing straight ahead on the stone road to Center Brunswick (passing red brick church on right) and other inter-

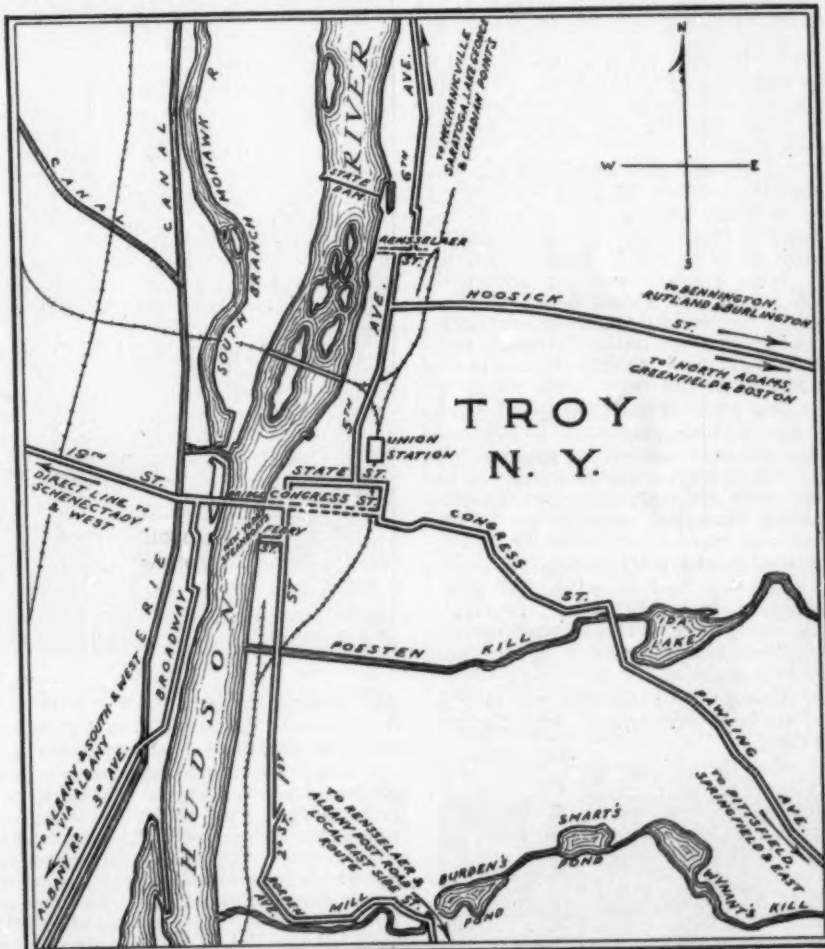
mediate points to Bennington and north. One inbound from points beyond Center Brunswick will recognize the entrance into Troy as soon as he runs into the territory covered by the diagram.

The exit from Troy toward Pittsfield and Berkshire Hills points is along with trolleys, on Congress street and Pawling avenue three miles out to Albia, Sand Lake and Glass House Lake (Brown's Hotel), where the two main routes to Pittsfield divide.

Except for a bad stretch on the Albany end, the run can be made from Rensselaer

Congress street bridge from Troy to Watervliet is direct into Nineteenth street, on which the trolley cars run as they leave Troy. En route to Schenectady and points west through that city one has only to follow Nineteenth street—a thorough, good road all the way from Troy. For a distance the trolleys leave the main highway, but only to return into them later. Nineteenth street, Watervliet, soon becomes the Troy road direct through Latham's Corners, Niskayuna and comes into Schenectady by Union street, one of the best city-and-suburban thoroughfares in the entire district.

Should the tourist wish to reach Cohoes from Troy, the best route is to follow the line already given from Troy to Waterford,



TOURING ROUTES EAST AND WEST AND NORTH AND SOUTH THROUGH TROY, N. Y.

to Troy all the way on the east side of the river, which would save crossing the bridge from Rensselaer to Albany, and again from Watervliet to Troy. The same east side line might be used at times to reach some local points south and east from Troy. The route is from First street with direct connection from Congress street bridge, practically direct down to the point where First street and Second street meet. Thence down through Burden avenue to left turn on Mill street, passing the old iron works, and then bending right across bridge into Vanderburgh avenue, beyond which the way is easy to find and follow.

except that instead of keeping all the way to the Waterford bridge, turn left from Second avenue, upper Troy, into Twelfth street. Follow the Troy-Cohoes trolleys across the Hudson River into Ontario street and go direct ahead across two branches of the Mohawk River and the canal all the way to the business center of Cohoes. However, one bound from Albany to Cohoes had much better take the Northern Boulevard from Central avenue, Albany, to Latham's Corners, from which a good road extends all the way to Cohoes, entering from the south, while going from Troy this place is entered from the east.

News and Trade Miscellany.

The race meet scheduled for February 16, 17 and 18, at Agricultural Park, Los Angeles, Cal., was postponed for two weeks on account of a rain storm. In order not to conflict with the February 22 hill climb, the two weeks' postponement instead of one was made. Bert Dingley, in Webb Jay's *Whistling Billy*, will go after the track record for a mile. It was over the local track that Barney Oldfield sent his Peerless a mile in 53 seconds. The Stewart-Garbutt car, which has a mark of :58, will race the White Skinner. There will be six races each day, with three events for the motorcycles during the meeting.

The Motor Car Company, of Baltimore, has opened a branch in Washington, D. C. Its territory for the Peerless and for the Stevens-Duryea includes that city.

The Mt. Vernon Motor Company has been recently incorporated in Baltimore. The incorporators are Messrs. Jesse B. Riggs, M. W. Pop, W. A. Fisher, Alfred R. Riggs and Thomas C. Goodwin. The latter will be in active charge of the new company, which has obtained the agency for the Haynes make.

An agency for the Oldsmobile has been opened at 531 North Howard street, Baltimore, by Oliver Light and C. D. Peroy, ex-fire chief of New York city. An extension is being made to the building, which has lately been erected, and an automobile school, whose object will be to turn out first-class mechanics, chauffeurs and salesmen, will be carried on in the roomy basement. This is the first thing of the sort ever attempted in Baltimore.

The new plant of the Continental Motor Company at Muskegon, Mich., is completed and the company expects to remove there from Chicago soon. The line shafting has already been shipped and representatives are at the Muskegon plant getting it into shape.

The new 100 by 100 foot building that is being erected by the DeFoe Boat and Motor Company at Bay City, Mich., is rapidly nearing completion. Manufacturing has already been begun in the completed portions of the building.

The Co-Operative Garage, of Detroit, Mich., has been incorporated, with a capital of \$100,000.

Following the Chicago show, Sales Manager Carter, of the E. H. V. Co., has been busy closing agencies in the Middle West. Robert C. Crowthers, of Cincinnati, has been awarded the agency at that point. A. E. Lazaro, of Hartford, Conn., has also been appointed a Compound agent.

Charles B. Shanks, general sales manager of the Winton Motor Carriage Co., and Mrs. Shanks, are spending three weeks in Florida and Cuba, chiefly on account of Mr. Shanks' ill health. At the Chicago show a cinder became imbedded in Mr. Shanks' left eye, necessitating a surgical operation and a rest from business.

The Los Angeles-San Diego Endurance contest on January 25 and 26 attracted much attention on the Pacific Coast. Regarding the performance of the Maxwell touring car in that contest, the San Francisco agents of the Maxwell-Briscoe Company have this to say: "It was announced at first that the Maxwell 'H' car won the cup, but after the decision we were scored one point on account of our car having on the same plate as the number the word 'Maxwell.' We had an absolutely perfect score and were the only car to make a perfect score in the light touring car class. Our numbers contained

the name of our car (as all the numbers that we use do) and C. F. Gates, the manager of the run, gave us permission to use this sign, as we had no other and always carried it. We were, however, awarded the gold medal for the excellent performance of the car and a silver medal for the driver."

The Chicago agency for the Michelin Products Selling Co., Inc., has been placed with Dan. Canary, temporarily located at 1220 Michigan avenue.

The Holsman Automobile Co., of Chicago, is erecting a new factory in the South Side district. When completed, about May 1 next, this will increase the company's capacity fivefold.

On the program of the first race meet of the season to be held at Grand Rapids, Mich., is a five-mile race between Dr. Perry Schurz, president of the Grand Rapids Automobile Club, driving his 50-horsepower Thomas, and Manager F. L. Holmes, of Jackson Automobile Co., driving a four-cylinder 40-45-horsepower Jackson. The conditions require the loser to present the front wheels of his car to the winner at the fair grounds track.

The Reuter Mfg. Co. has acquired an old doll factory at Pleasantville, N. J., where it will begin the building of automobiles and motors as soon as the necessary alterations have been made. A quantity of new machinery will be installed during the present week and twenty-five hands will be employed.

The Fort Pitt Automobile Company is a new concern in Pittsburg. J. H. Stubbe and A. G. Summerville are the promoters. The latter formerly had charge of the supply department of the Standard Automobile Company, and the former was foreman in its shops. They will handle the Stearns and the Locomobile.

The Keystone Automobile Company, of Pittsburg, has secured the agency for the Welch car, manufactured in Pontiac, Mich.

George W. John, formerly of the Pope-Toledo traveling force, is now with the Moon Motor Car Co., of St. Louis, Mo., as general salesman.

J. A. Holsman, until recently president and general manager of the Illinois Auto & Parts Co., Peoria, Ill., has resigned from active management of the company.

Ground was broken the second week in February by the Aerocar Company, of Detroit, Mich., for the erection of a large addition to their already big plant, and the work is being pushed to completion with a rapidity which calls for all that is strenuous in contractors and workmen. The company's initial output for the year was placed at 500 cars, but the New York show took up more than half of this number and there were not enough left to supply the demand at the Chicago show, thus necessitating immediate arrangements for practically doubling the initial output.

Signor Zust, an Italian engineer and automobile manufacturer, has arrived in New York, bringing with him some particulars of the tourist race to be run May 15 to 25 under the auspices of the Automobile Club of Milan. This is to be an endurance contest, and the cars will be divided into three classes—heavyweight, middleweight and lightweight.

"Automobile Row" in Chicago will have some new additions in the near future. The Greer Motor Car Company will break ground for its new garage at 1417-1419 Michigan avenue in the next two weeks, and hopes to occupy the structure by May 1.

The Chicago branch of the Fisk Rubber Company will occupy quarters at 1438-1442 Michigan avenue before many months have passed. Excavating for the new building at that site began last week.

The Northern Motor Car Company, of Chicago, is now occupying the entire building at 1449 Michigan avenue. It was formerly located on the second floor of the same building, the first floor having been occupied by the McDuffee company, which is now situated a little farther south.

A class of women will begin receiving instructions this week in the "art" of operating an automobile at the National Automobile School, Oxford and Carlisle streets, Philadelphia. This innovation was forced upon the management by the many applications recently received from women.

There is a movement afoot to build in Philadelphia a large convention hall, which shall equal in size, if not excel, the largest building of the kind in the country. The site proposed is adjoining the Export Exposition Building in West Philadelphia, where next week's automobile show is to be held.

The Rapid Motor Vehicle Company, of Pontiac, Mich., is ready to remove to its new factory, adjoining the D., G. H. & M. railway tracks, and within the next month will have sufficient machinery installed to treble the present output of commercial cars.

The manufacture of commercial vehicles gives such promise of great magnitude that plans are being considered by the Olds Motor Works, of Lansing, Mich., for the enlargement of its factory for the special purpose of pushing this branch of the business. The plans have not yet been reduced to paper, but it is said by officials of the company that a considerable enlargement is contemplated.

The Studebaker car will hereafter be represented in Philadelphia by Titman, Leeds & Co., who will succeed the LaRoche Automobile Company and will occupy that concern's quarters at 317 and 319 North Broad street.

E. R. Thomas, of Buffalo, N. Y., is spending several weeks in California touring from one winter resort to another. The indications are that there will be a host of Eastern tourists in California during the remainder of the winter and in the early spring season. This may be judged by the fact that the concern of which Mr. Thomas is the head has received no less than forty-eight orders from its New York, Boston and Chicago agents to have machines sold by them delivered in California. This shows that those who formerly spent their winters in the sunny countries of Southern Europe are now realizing the beauties of their own land.

The produce of the Columbia Electric Company, whose principal offices and salesrooms are in Indianapolis, will include a runabout this season in addition to the touring car manufactured in 1905. It is announced that the capacity of the factory is to be doubled within the next few months. The touring car will be practically the same as the one made by the company last year, with the exception that the engine will be increased from 4 1-2 by 4 1-2 to 4 1-2 by 5 and will develop 16 horsepower. It has two cylinders, opposed, with center chain drive and heavy planetary transmission. The runabout will have a 4 1-2 by 4 1-2 double opposed engine with center chain drive and planetary transmission. The engine will be placed under the front seat and the seat will be semi-divided and handsomely upholstered. In the rear will be a torpedo detachable deck, which will permit of a tonneau being added at small expense.

INFORMATION FOR BUYERS.

DETACHABLE RIM.—The new Marsh quick detachable rim for clincher tires, the exclusive control of which has been vested in the Diamond Rubber Co., of Akron, Ohio, consists of three parts—the rim body proper, which is permanently attached to the wheel; the removable outer flange of the rim, and a locking ring which holds the removable flange in place. There are no separate small parts. The locking ring is U-shaped. It is



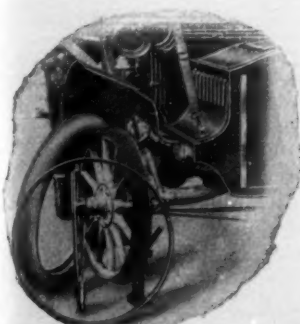
STARTING TO REMOVE LOCKING RING.

held in position by expansion, but its security in place is further strengthened by the use of a small, easily operated lock. The U shape of the locking ring causes it to engage a bead projecting downwardly from the rim flange which it holds in place, making the escape of the flange impossible whether the tire is inflated or not. The



SLIPPING OFF OUTER FLANGE.

entire mechanism is very simple and easy of manipulation. The accompanying engravings show the method of removal of a tire with the Marsh rim. Reversal of the operations illustrated will return the tire to place again. No tire staybolts are used

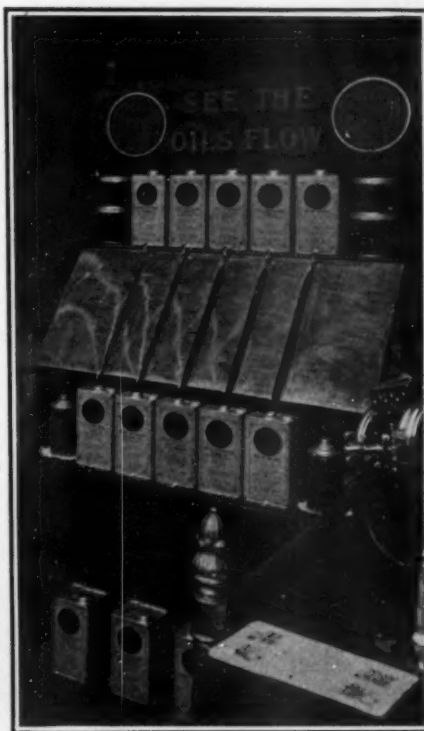


TIRE COMPLETELY REMOVED.

with the rim, but as an additional safeguard against "creeping" the inner tubes of the

tires are fitted with a rubber-headed staybolt which becomes a part of the metal valve stem of the tube and is tightened or loosened simultaneously with the tightening or loosening of the lock-nut of the valve stem.

FLUID OILS.—One of the interesting exhibits among the sundries displays at the recent automobile shows was the arrangement for showing the relative fluidity of Harris oils of different composition and consistency. As shown in the accompanying engraving, an inclined metal plate was arranged on a standard so that streams of



DEMONSTRATION OF HARRIS OIL FLUIDITY.

oils could flow from cans above into similar cans below, the position of the cans being reversed when the lower ones became full. This exhibit arrested the immediate attention of every show visitor who passed the Harris Oil Company's stand, and the regularity and "smoothness" of the flowing streams of both light and heavy lubricants elicited many comments.

NEW INNER TUBE.—A new inner tube has been placed on the market by the Electric Rubber Manufacturing Company, of Ruthersford, N. J., with a view to obviating some of the troubles that follow the use of the pneumatic tire. The tube referred to has a jacket or outer covering of fabric which, the manufacturers state, gives several distinct advantages. The tube will not tear easily if punctured, the fabric preventing the extension of the hole; blow-outs are less liable to occur for the same reason. The tube will not stick to the inside of the case. In case of puncture, it is claimed that the new tube is as easily repaired as an ordinary all-rubber tube. The tube is free to expand laterally when inflated, but the fabric is practically inextensible longitudinally. This tube, as well as the wrapped tread tires and the moulded tires made by the same concern have been given the trade

name "Panther." A pamphlet issued by the company gives prices and other information regarding these goods.

TRADE PUBLICATIONS.

Hutchison Electric Horn Co., 1 Madison Avenue, New York.—Circulars illustrating and describing the Hutchison electric horn, Hutchison dry storage battery, and storage battery charging outfit.

Thos. B. Jeffery & Co., Kenosha, Wis.—Catalogue of the well-known Rambler gasoline automobiles. Much information concerning the cars is condensed into a catalogue of unusually handsome appearance.

Electric Vehicle Company, Hartford, Conn.—Pamphlet entitled "Fashioning a Crankshaft" deals concisely with the method of making the Columbia crankshaft, which is machined cold from a solid block of steel.

The David Maydole Hammer Co., Norwich, N. Y.—Catalogue of hammers of all kinds, made exclusively of crucible-cast steel. This concern has been making hammers for sixty years, manufacturing nothing else.

Kobusch Automobile Co., St. Louis, Mo.—Advance catalogue of the American Made Mors cars, manufactured by this concern. Illustrations of the various styles of chassis and bodies are given, together with price list, etc.

Diamond Rubber Co., Akron, Ohio.—Pamphlet entitled "A Million Miles on Diamond Tires," containing letters from users of Diamond tires whose total mileage aggregates more than 1,000,000 miles. The little book is an interesting novelty.

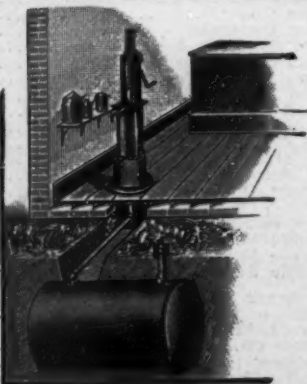
Jackson Automobile Co., Jackson, Mich.—Catalogue of Jackson gasoline automobiles. This catalogue is not only a good specimen of catalogue work from the printer's point of view, but gives practical information about the Jackson cars—a matter of importance to the man who wants to buy a car.

Michigan Top Company, 17 Duffield street, Detroit.—Catalogue giving illustrations and descriptions of Coombs folding tops of all kinds, for all types of machines, from the smallest runabout to the largest touring car. The illustrations are made from photographs of cars fitted with the Coombs tops.

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THE NATIONAL GASOLINE TANKS

☛The National Long Distance Gasoline Storage Outfit, which permits of placing the supply tank under ground, the pump being inside the building. In perfecting this outfit we have observed to the letter the rules of the underwriters' Laboratories, and can recommend it to be the safest and most economical way of handling gasoline ever devised. ☛This pump is one of our latest, Double Cylinder, which in operating there is no lost motion, every movement of the handle pumps and measures oil, saving time, labor and money. ☛This outfit is especially designed for Automobile Garages. ☛Ask for Catalogue.

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